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A Journal of British and Foreign Medicine, Surgery, Obstetrics, Physiology, Chemistry, Pharmacology, Public Health, and News.

TELEGRAPHIC ADDRESS—LANCET, WESTRAND LONDON TELEPHONE NUMBER—GERRARD 5356

No. V. of Vol. II., 1917.
No. 4901. Vol. CXCIII. LONDON, SATURDAY, AUGUST 4, 1917. Price 8d.

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ON

MEAT INSPECTION,

WITH SPECIAL REFERENCE TO THE DEVELOPMENTS OF RECENT YEARS.

Delivered before the Royal College of Physicians of London

BY WILLIAM J. HOWARTH, M.D. MANCH., D.P.H.,

MEDICAL OFFICER OF HEALTH, CITY OF LONDON.

LECTURE I.

MR. PRESIDENT AND GENTLEMEN,—Permit me to express my appreciation of the honour which you have conferred on me by nominating me to deliver the Milroy Lectures for the year 1917.

INTRODUCTORY.

The subject of Meat Inspection will, I believe, receive more attention after the war than has been the case in previous years. Many striking anomalies, and defects of an administrative character which call for reform and improvement exist, and to these official notice was being directed before the great upheaval temporarily relegated them along with other reforms to a position of comparative obscurity.

The distinguished physician with whose name these lectures are associated, and owing to whose munificence they have been established, enumerated in a peculiarly happy manner certain principles of necessary sanitary reforms which have proved to be almost prophetic since they outlined the directions along which practically all later sanitary improvements have progressed. Sufficient time has elapsed not only for these principles to have been put into practice, but for definite results to have been realised, and nobody can deny that they have conferred measureless benefits on the community at large. It must also be a source of satisfaction to English sanitarians to know that their earlier lines of action were so fully appreciated by workers in the same field in other countries that they followed the lead thus given with equally gratifying results.

It is possible that least interest has been displayed in matters associated with the control of the food of the people, and one may safely say that it is only within the last 10 or 15 years that this subject has received the serious attention which it merits. This is somewhat surprising, for although the lead in sanitary reform must rightly be given to Great Britain progress in matters associated with the food-supply has been much more rapid in other countries.

In these lectures only that part of the subject which deals with the inspection of flesh meat will receive attention, and even with this limitation many important topics will not be considered. It will be my endeavour to emphasise the fact that a system of meat inspection cannot be regarded as satisfactory until greater uniformity is secured, and that the actual details of inspection cannot be efficiently observed unless adequate facilities exist. But given the existence of suitable arrangements under these two headings, the fact that a carcass has been submitted to inspection should be noted on the carcass, otherwise much work will be duplicated and wasted energy be the chief result of reform. It follows, further, that if an inspector is to accept responsibility for his decisions he should be guided by official regulations, otherwise the personal element will step in, and the opinion of one man will be played off against that of another as is the case to-day, with the result that many experience unnecessary hesitation in arriving at a decision, and much confusion exists. The chief disease affecting cattle in this country is tuberculosis, and as differences of opinion exist as to the action which should be taken, this subject will be fully discussed. Imported carcass meat and offal now form a considerable part of the general meat supply, and therefore the chief features associated with this trade will be considered. As an associated development the question of the regulation of cold stores will be referred to, and finally the desirability of reform in the handling of meat will be emphasised.

LACK OF UNIFORMITY IN MEAT INSPECTION.

Meat inspection in this country, with the exception of that conducted at a few special centres, is carried out by sanitary authorities in a distinctly haphazard manner. The work is rarely undertaken energetically, nor are there any regulations to control the system as it exists except as affecting foreign meat and the recommendations of the Royal Commission of 1898. The former indicate a definite line of action to be taken in certain circumstances; the latter, however, are submitted in the form of advice, and although fairly sound are not entirely satisfactory. Authorities are advised by the Local Government Board to require that inspectors, among whose duties may be included the inspection of meat, shall furnish evidence of competence, but I do not think this is a firm requirement in those districts in which there is only a single inspector. In addition to these deficiencies the fairly general absence of facilities for adequate inspection adds to the difficulties, with the result that want of uniformity exists both in the amount of inspection which is undertaken and in the decisions which are arrived at in comparable cases.

Absence of uniformity of inspection affords opportunities for the practice of much deceit, with the result that both the public and the honest trader are prejudiced. The former since it is possible for meat of unsound character to be sold, and the latter since he is handicapped in trade by a competitor who takes advantage of the local negligence which he knows exists.

Instances illustrating these facts could be quoted from official sources, and though much remains to be done before a satisfactory system exists, the position is apparently improving, for the Local Government Board in the Report for 1912–13 (p. lvi.) state that "of late years public attention has been increasingly directed to the importance of maintaining the purity of meat supplies. Partly as a cause and partly as a result of this, local sanitary authorities have, through their officers, increased the vigilance of inspection." It is probable that this improvement is taking place chiefly in the large urban centres and in districts where officers who have specialised in public health work are engaged. That there is by no means a universal improvement will be gathered from the consideration of meat seizures in a year in any large area.

Meat Condemnations in a Well-inspected Area.

As a preliminary to the consideration of other figures, and for the purpose of giving some idea of the number of carcasses and offal which are condemned in a well-inspected area, figures are submitted which relate to condemnations in the private slaughter-houses situate within the area of the City of London at Aldgate. At these places an inspector is always on duty whenever slaughtering is in progress, as also is one or more Jewish officials, whose chief duties are to approve carcasses as kosher meat, for which purpose a considerable number are slaughtered on these premises. A by-law is also in force which requires butchers to give notice if they intend to slaughter animals before 7 A.M. or after 3 P.M. on Sundays, and before 6 A.M. or after 9 P.M. on week-days. Supervision is therefore constant.

The number of different animals to which the classification relates is: cows, heifers, and oxen, 68,438; calves, 50,288; sheep, 102,912. Of these, 341 whole carcasses of beef and 197 quarters were destroyed as unfit for human consumption, as well as 139 whole carcasses and 21 quarters of veal, and 275 whole carcasses and 28 quarters of mutton. This indicates that about 5 per 1000 cattle are *wholly* condemned and over 2·5 per 1000 calves and sheep respectively.

Table I. shows the number of organs seized among the different animals on account of the principal conditions requiring condemnation in English slaughter-houses.

Although the slaughtering of these animals was carried out in private places, the facts that the premises were adjoining and the supervision constant justifies the assertion that the figures may be taken as representing the average condemnations in a satisfactorily supervised public abattoir. The number of carcasses, parts of carcasses, and organs condemned is sufficiently large to indicate the necessity for effective supervision of the slaughtering of food animals if the interests of the public are to be adequately safeguarded.

TABLE I.—*Principal Causes of Condemnation of Organs among Animals Slaughtered at Aldgate.*

Cause.	Heads.	Tongues.	Lungs.	Hearts.	Livers.	Stomachs.	Spleens.	Kidneys.
68,438 Cattle.								
Abscess	252	96	242	2	2202	55	17	10
Actinomycosis	974	1386	73	—	—	2	—	—
Blood aspiration	—	—	848	—	—	—	—	—
Cavernous angioma	—	—	—	—	172	—	—	—
Cirrhosis	—	—	—	—	324	—	—	1
Nephritis	—	—	—	—	—	—	—	143
Parasitic diseases	—	—	2065	—	5959	—	2	1
Pericarditis	—	—	—	150	—	—	—	2
Peritonitis	—	—	—	—	6	61	7	—
Pleurisy	—	—	2283	—	—	—	—	—
Pneumonia	—	—	434	—	—	—	—	—
Tuberculosis	2699	705	2806	485	1338	688	592	794
50,288 Calves.								
Abscess	4	2	11	4	70	3	8	—
Asphyxia	22	23	22	23	23	23	23	46
Hydræmia	11	11	11	11	11	11	11	22
Nephritis	—	—	—	—	—	—	—	9
Parasitic diseases	—	—	110	—	22	—	1	—
Pericarditis	—	—	—	14	—	—	—	—
Pleurisy	1	1	22	1	1	1	1	2
Tuberculosis	32	57	120	49	112	44	91	76
102,912 Sheep.								
Abscess	8	7	57	23	49	3	21	4
Asphyxia	26	26	26	26	26	26	26	52
Blood aspiration	—	—	82	—	—	—	—	—
Cirrhosis	—	—	—	—	6	—	—	—
Emaciation	30	30	30	30	30	30	30	60
Hydræmia	70	71	67	83	72	66	71	60
Nephritis	—	—	—	—	—	—	—	33
Parasitic diseases	2	—	2921	—	3485	—	16	—
Pericarditis	—	—	—	27	—	—	—	—
Pleurisy	3	3	237	3	3	3	3	6

The tables are compiled from summaries commenced by my predecessor, Dr. W. Collingridge, and Mr. T. Dunlop Young, M.R.C.V.S., veterinary surgeon to the Corporation.

Inadequacy of Meat Inspection.

For comparative purposes the number of condemnations in a single year in an area comprising about a million persons has been extracted from the annual reports of the district medical officers of health. All the districts within the selected area are included in the summary and, as there is only one county borough of small size, there are no centres from which well-inspected meat can be distributed on a large scale excepting London, which, of course, supplies a considerable amount of carcass meat to that part in closest contact. The area extends from London to the Channel.

There were 10 urban areas with a combined population of 298,000 and 3 rural areas with a population of 59,000 in which meat was reported as having been condemned. In the urban districts the total condemnations were 12 carcasses of meat, 3 carcasses of mutton, 1 pig carcass, and certain pieces of indefinite character or amount, such as 1 cwt. of pieces of beef and pork; several pieces of beef; parts of the carcasses of 8 bullocks, sheep, and pigs; a sheep's liver; large quantities of unsound meat, fish, and fruit, a quantity of meat, and 225 lb. of frozen meat. In the rural districts the condemnations were one quarter of beef; "the carcass of a strangled bullock"; 50 lb. of meat; and a "considerable amount of meat."

In 15 urban districts and 5 rural districts with aggregate populations respectively of 173,000 and 68,000 the reports definitely stated that no unsound meat had been discovered.

In the reports relating to 16 urban districts and 7 rural districts, with respective populations of 236,000 and 184,384, the subject was not referred to, and it is probable that in the majority of these places no unsound food had been dealt with.

Although it is impossible to state the number of animals slaughtered in any area in which inspection is only partially carried out it must be considerable in a population of 1,000,000, even if it is allowed that 45 per cent. of the supply is frozen or chilled imported meat, or that some home-killed meat in the carcass form is purchased at Smithfield, and the deduction is permissible that the figures stated indicate that meat inspection could not be practised on a much more meagre scale. This fact is further emphasised when it is remembered that of the meat condemned a certain proportion was seized at military camps as a result of inspection by the military officers, since it may be assumed that if a certain amount of meat brought to these camps, with the knowledge that it will be inspected, is found to be unfit for human consumption, the general supply must also contain many more instances than those mentioned. The inadequacy of meat inspection in these selected districts is not exceptional, and I do not believe it is worse than that in similar districts.

As further bearing on this subject it should be observed that there is the risk of an excess of unsound meat being sold in districts in which meat is not examined, and more particularly when they adjoin or are in close proximity to a large town in which meat inspection is reasonably carried out. After the opening of the public abattoirs in Bury (Lancs.) Dr. A. E. Brindley[1] reported that—

"It has not been an uncommon experience for the owner of an animal condemned by us to tell the inspector that it is the last time he will have the chance of taking any of his animals, and it has been found in each case that no more animals coming from this source have been slaughtered in the abattoirs. One naturally infers that animals from such a man are now sent to other districts where inspection is less thorough."

This avoidance of supervision certainly ought not to be possible.

Absence of inspection in circumstances such as these also renders possible a trade in unsound carcasses for use in prepared meats. These foods are manufactured chiefly from lean meat such as is frequently found on the carcasses of old animals. These animals may have suffered from tuberculosis and whilst not marketable in the carcass form may avoid detection if cut up into small parts and all evidence of disease removed. That a trade in doubtful meat of this character does exist is undeniable, and it is most difficult to detect. If packed in baskets after being boned or even if loosely thrown into carts the careless method of transportation supports the contention that it is intended to be used for feeding animals, and it is only when discovered on food-preparation premises, or when actually being so transferred, that the evidence of ultimate use is sufficient to justify magisterial proceedings. Such meat can also be so trimmed, or parts selected with sufficient ease, to render it difficult to detect disease. In view of the fact that more instances of ill-effects to the community have been reported in recent years in this country from the consumption of prepared meat than of fresh meat it is desirable that all meat intended for use in the prepared form should be examined and passed before being so used.

Tuberculous Animals: Question of Compensation.

Butchers have long endeavoured to obtain from the State compensation for the condemnation of animals slaughtered for human food which are found to be suffering from tuberculosis.

In 1904 a Select Committee was appointed to consider the Tuberculosis (Animal) Compensation Bill and in their report attention was directed to the loss which butchers sustain from the seizure of home-bred pigs affected by tuberculosis. Several witnesses had suggested that the regulations were too stringent. The lines on which compensation should be paid if the State accepted the liability were formulated and included the requirement of proof that (*a*) the purchase of the animal was made in good faith as to fitness for human consumption; (*b*) there was no proof of illness at the time of purchase; (*c*) a fair price had been paid; and (*d*) notification was made to the local authority as soon as the butcher discovered that he had a tuberculous carcass on his premises.

It is highly improbable that the State will ever agree to give compensation in these cases as no adequate return would result in the way of eradication of the disease. The condition is, however, so prevalent that the risk may seriously handicap some traders, and although compensation by mutual agreement would appear to present a solution of the difficulty, the differences in the standard of inspection are so great that a general arrangement appears at the present time to be almost impracticable. It is obvious that in a well-inspected district a trader would be paid more out of the funds than one in a less-inspected district and so there would result inequality on a basis of equal contributions. Contributions on a differential basis could not

[1] Public Abattoirs. A. E. Brindley, M.D., D.P.H. Public Health, xviii., 442-450.

be arranged. It is not until a system of meat inspection has been devised which will give more uniform results that voluntary insurance will come to pass. If such a state of affairs existed butchers might, in addition to mutual insurance, demand to buy under a guarantee. This would result in cattle-breeders being more careful with all-round improvement as regards stock. At present no guarantee is given by the cattle-dealer, for the very good reason that he is able to sell to a butcher trading in an ill-inspected district without such guarantee, and there is no reason why he should sell to one in a better-inspected area and accept risks which would involve him in monetary loss.

FACILITIES FOR ADEQUATE INSPECTION.

The subject of improved facilities for the inspection of meat involves a consideration of the condition of existing slaughter-houses and the policy of providing public abattoirs. Private slaughter-houses have always been regarded unfavourably by those engaged in sanitary work, and attempts have been made to effect improvement, but with only partial success. There exist outside the metropolis the following classes:—

(*a*) Slaughter-houses in rural districts which are unlicensed and practically uncontrolled.

(*b*) Slaughter-houses which existed prior to 1875 which were registered with all their defects as regards structure, situation, &c., and which possibly can only be dealt with when nuisance arises, though as regards general management and control they must conform to the by-laws in force in the district.

(*c*) Slaughter-houses to which a licence was granted between 1875 and 1890, the date of the Public Health Acts (Amendment) Act. To these places was granted a non-terminable licence, and defects are not remedied without some difficulty, and

(*d*) Slaughter-houses licensed subsequently to 1890, in which case the licence is granted for a fixed period, and if at the termination of the period conditions are not satisfactory, renewal may be refused until improvements are effected.

In London, slaughter-houses have been licensed since 1885, and by the Public Health (London) Act, 1891, the London County Council is the licensing authority. Notice must be given of intention to apply for a new licence or to renew an existing one to the sanitary authority of the district in which the premises are situate; this enables the authority to show cause against the grant or renewal of the licence, if it so desires.

Divergent Views on Private Slaughter-houses.

Private slaughter-houses are unsatisfactory on the grounds that they are (*a*) objectionably situated, and thus give rise to nuisance, are unduly public, and contribute to danger from driven animals, and (*b*) that they lack the minimum requirements of general hygienic efficiency and facilities for inspection. Nuisances may be dealt with, but very limited opportunities exist for improvement of defects associated with bad position or absence of inspection facilities. Even in well-built slaughter-houses difficulties arise owing to the fact that the places are often widely separated, and an inspector loses time and fails to maintain oversight by having to journey from one place to another. This fact was clearly shown by Dr. Brindley,[2] of Bury. During the year 1898-99 the meat inspector paid 5026 visits to the 37 slaughter-houses and yet only succeeded in examining 59 per cent. of the cattle, 29 per cent. of the calves, 19 per cent. of the sheep and lambs, and 54 per cent. of the pigs. This compares with an inspection of 99 per cent. of all animals slaughtered in the town after the establishment of the public abattoirs. It is further of importance to note that although the number of animals slaughtered in the town remained practically the same, double the number of organs was condemned, and the amount of meat destroyed was three times that during the time inspection was conducted in detached slaughter-houses.

Internal conveniences such as light, room, and benches for the careful examination of organs are meagre, and when a carcass is put aside to set for further examination accidents result in its removal or the offal which it is often necessary shall be examined with a carcass may easily be confused, or wilful substitution may be attempted if the inspector is not present at the time of dressing the carcass; in fact, the last point to be considered in a private slaughter-house is the convenience of inspection.

As against these objections on the part of the local sanitary authority the trade claim that private places have certain advantages to them.

There can be no doubt that a slaughter-house adjoining a butcher's premises is an advantage. It must be a great convenience to be able to slaughter and retain the carcasses on the premises until required for sale. At the same time, supervision of the general conduct of employees is more easily maintained than would be the case if they worked at a distant abattoir. It is also suggested that the conveyance of carcasses from the place of slaughter to business premises results in more or less injury. In this connexion it certainly cannot be argued that cartage improves flesh meat, but the importance of the objection may easily be exaggerated. All imported meat is subjected to much more handling than is home-killed, and at many of the large wholesale markets all meat there deposited for sale is conveyed both to and from in the carcass form. Financial considerations are sometimes mentioned, since slaughter in public places is always subject to a charge, which is not the case when a butcher has a slaughter-house attached to his shop, and if he were compelled to cease slaughtering possibly there would not be an equivalent reduction in rent.

These more or less personal objections ought not to invalidate alternative methods which are designed more completely to safeguard the interests of the public, but in some instances a good claim can doubtless be made for compensation in the event of compulsory closures when a public abattoir is established. A slaughter-house to which a non-terminable registration or licence has been granted and at which trade has developed with this privilege attached would appear to have established a claim to compensation for disturbance if slaughtering is prohibited on grounds of public expediency. In assessing compensation due regard would be paid to the fact that the privileges and advantages which are enjoyed may be in association with premises which in varying degrees are unsatisfactory from a sanitary point of view, and thus varying degrees of contribution would result, ranging from a maximum where conditions were satisfactory to a minimum when the existence of the place could not be justified. Hardship would be minimised by giving a sufficiently long notice of intention to close. Terminable licences do not seem to require more than a sufficiently long notice of intention to cease to renew the licence.

It hardly seems possible to reconcile these widely divergent views of the sanitary authority and the trade, and there seems no possibility in the near future of public slaughter-houses replacing private places. On the continent public slaughter-houses have followed State regulations requiring, *inter alia*, that the carcasses of animals intended for human consumption shall be inspected. It follows that if it is necessary for animals to be inspected they shall be marked in some distinctive manner after they have been passed, and as this work can best be done in public places the person slaughtering in a private place is handicapped since he must wait the convenience of the official inspector before he can remove the carcasses. I believe, therefore, that abattoirs would be required by the trade if some system of marking, based on official regulations, could be established.

THE MARKING OF MEAT.

Some 17 or 18 years ago the question of marking meat was under consideration in a fairly acute form owing to the development of the imported meat trade. This trade increased as the importation of live cattle declined. In the earlier days much poor quality meat was exported to this country, and then, as now, much inferior home-killed meat was sold. This latter was occasionally sold as "Colonial." The traders in each class of meat were dissatisfied, hence the demand for a distinctive mark.

The marking of imported meat by means of an "Official Certificate," which is limited to the flesh of the pig, became part of the legal machinery as a consequence of the Foreign Meat Regulations, 1907, but otherwise the marking of meat is no part of our own official requirements. The marks which are observed on other meat than pork are either the marks of Government inspectors in the country of origin or traders' private marks.

[2] Ibid.

The official certificate furnishes evidence that the pig from which the meat is derived has been certified by a competent authority in the place of origin to be free from disease at the time of slaughter, and to have been dressed, prepared, and packed with the observance of all requirements to prevent danger arising to the public health from the use of the meat as an article of food. It does not exempt meat so certified from liability to inspection.

In the cities of Belfast and Exeter and the Burgh of Hamilton the marking of meat is being undertaken as a local act, and to some extent by arrangement between the butchers and the local authority. The chief danger to be apprehended from the general extension of similar arrangements is that each district will arrange its own standard, and as this may vary, uniformity will not be obtained. For this reason also the mark may not be accepted generally as proof of adequate inspection, and the only satisfied parties will be those in the district which have approved the system.

Uniformity of practice and decision are the first essentials in any system of meat-marking, and this can only be obtained by Government supervision. Such a system would necessitate, furthermore, that officials who may be empowered to inspect and mark shall be competent accurately to interpret the spirit and to determine the significance of regulations, since no series can be compiled which will give a dogmatic ruling to meet every contingency. Proof of adequate knowledge would be essential before appointment.

Adequate facilities for inspection would also be necessary. In many districts the want of facilities would prove a barrier at the present time to general meat-marking. The difficulties would be greatest in rural districts where slaughter-houses are widely separate and in which slaughtering is conducted at irregular intervals. In districts provided with a public abattoir the additional labour would prove insignificant.

It has been suggested that central clearing-houses would prove a suitable middle course between inspection at the time of slaughter and inspection in shops. True, such a provision would be valuable if the offal were brought to the central station still attached to the carcasses, as is required in many continental cities, but otherwise there would practically be no difference between the inspection at a clearing-house and that at a wholesale market. To agree to mark carcasses in these latter circumstances would be a retrograde step, as the examination would be often unreliable and the hurry and stress of obtaining release from a busy clearing-house would result in ineffective examination even with the provision of a large number of inspectors.

It is quite obvious that the introduction of meat-marking would alter the fundamental principles of responsibility which attach to the existing system—i.e., from the standpoint of diseased conditions. At the present time the butcher is responsible for the soundness of the meat he sells, and the inspection is a sort of detective method which attempts to discover him in default, and often no excuse is accepted for the difficulties associated with the case. This responsibility is one which should devolve upon the inspector, who should examine each carcass and approve or reject it. Having approved it an owner ought to be absolved from blame if disease is discovered at a later stage, say when cutting up the carcass. Now, unless meat is marked after an inspection carried out in circumstances which admit of all evidence of soundness or disease being available, and that is not possible in a wholesale market, the mark would involve the inspector in responsibilities beyond what the circumstances justify. There would be an increasing tendency to this end, for persons of doubtful integrity might prefer to submit diseased carcasses to this central inspection rather than to slaughter-house inspection, and thus gain a possible advantage.

Suggested Scheme.

I am satisfied that the present want of uniformity, the scarcity of competent inspectors, and the absence of facilities would render a universal system of compulsory meat marking impracticable at the present time, but nevertheless I consider that the advantages to be derived are so considerable that a system on an adoptive basis under Government control would prove of value and lead to the adoption of a general system in the future.

I suggest that it would be a desirable step for the Local Government Board officially to approve a system of meat marking, and for that purpose decide upon the nature of the mark and the manner of marking, and also take steps to safeguard the use of the mark only by a recognised authority. The use of the mark should be limited to carcasses examined at the time of slaughter.

The power to use such mark should only be granted on request and after the Local Government Board are satisfied that the local authority making the request may reasonably be expected to maintain satisfactory inspection of meat. Such permission should have regard to the number of inspectors employed, their competence to carry out the work, and the facilities which are available. Powers should likewise be granted to make a charge for this service, a maximum being stated. If this charge is allowed it should be within the power of any butcher slaughtering within the district of an authority empowered to mark meat to require the local authority to examine and mark the carcasses of all animals slaughtered by him if he enters into an arrangement with the authority and pays for the services thus rendered. It is probable that in districts provided with a public slaughter-house no charge would be necessary, but in large urban districts unprovided with a public abattoir an addition to the inspectorial staff might be required, and the charge would help to cover the cost of the extra help if the increased advantages to the public were not regarded as an adequate return. In most rural districts more or less concentration would be necessary, and if this did not exist marking would not be practicable. This would be a fairly general condition of affairs at first, but I am of opinion that if the public is educated to appreciate the value of marked meat an increased demand would arise for it, with perhaps a slight increase in value, and in both rural districts and in those urban districts with numerous scattered private slaughter-houses the butchers themselves would ultimately ask that public abattoirs be provided to enable the local authorities to carry out the additional inspection which marking would entail.

Power should be granted to authorities who have been given permission to mark meat to require, in the case of prepared foods used for human consumption in such area, that only marked carcasses shall be used for that purpose.

If the Local Government Board arranged for the recognition of marking, a more or less detailed system of inspection would require to be formulated. This of itself would prove a distinct advance in meat inspection.

REGULATIONS AS AFFECTING MEAT INSPECTION.

Very little progress in meat inspection can be expected until official regulations to control the work have been issued. Among other matters a complete series would provide for (*a*) the manner of conducting both ante-mortem and post-mortem inspections, (*b*) instructions as to action to be taken if unsoundness is discovered, (*c*) suggestions as to the disposal of unsound carcasses, (*d*) requirements as to sanitation, provision for enabling inspections to be carried out, and qualifications of inspectors, (*e*) regulations respecting the hours of slaughtering in places where control can be arranged, and (*f*) the requirements to be observed before a carcass is marked, if "marking" is officially approved.

In the first place, inspection—as far as may be practicable—of all meat intended for human consumption should be a compulsory duty imposed on urban sanitary authorities.[3]

In rural districts it should be a requirement that at least those slaughter-houses in which animals are slaughtered for consumption outside the sanitary area in which the place is situate should be licensed, and that regular inspection of

[3] The requirement that a local authority shall undertake the inspection of meat is only indirect and is contained, as regards districts outside London, in the General Order of the Local Government Board of Dec. 13th, 1910, in the articles referring to the respective duties of Medical Officers of Health and Inspectors of Nuisances. Similar requirements affecting areas to which the Public Health (London) Act, 1891, applies, are contained in the Order of Dec. 8th, 1891. The respective wordings are as follows:—

Outside London an inspector of nuisances "shall from time to time, and forthwith upon complaint visit and inspect the shops and places kept or used for the preparation or sale of butchers' meat ..... and examine any animal carcase, meat ..... which may be therein ..... etc."

A medical officer of health, "in any case in which it may appear to him to be necessary or advisable, or in which he shall be so directed by the Council ..... shall himself inspect and examine any animal, carcase, meat ..... etc."

In London the requirement to inspect meat, &c., is in similar terms.

It appears to me that this instruction is of such a general character that the performance of a minimum amount of supervision or inspection of meat would exculpate an inspector from any charge of apathy in this connexion which might be brought against him.

animals slaughtered therein should be practised. With the development of a system of marking it would be possible at a later date to require that the carcasses of animals intended for another district should have been inspected and marked before being transferred.

It is also essential that men engaged on meat inspection work should be competent for the purpose. It would appear that any development in this direction would require that there should be two grades of inspectors—viz., an expert officer who would not only appreciate the reason for any particular regulation, but who would be capable of forming a judgment on conditions not specially provided for, and a second group who would correspond to the lay inspectors of foreign countries. These would require to be able to recognise diseased conditions and be competent to decide in certain cases and recognise that in others the opinion of one more skilled is necessary. Sanitary inspectors, provided they have undergone a special training, might be trusted to do this latter work, and as regards the former it is becoming more and more the practice for large public health departments to appoint a veterinary officer. When the new milk legislation comes into operation the scope of the veterinary profession in this connexion will be increased.

Proper supervision would not appear, therefore, to be a matter difficult to organise. It would require that all local authorities should have on their staffs inspectors competent to undertake ordinary routine inspection—this could be made a requirement as future vacancies arose—and that county councils should arrange that the rural areas and smaller urban areas should have available the services of their veterinary inspectors for expert decision in cases where doubt exists or where support in probable legal proceedings is necessary or even for general supervisory work. In the matter of competence, the ordinary veterinary surgeon and the general medical practitioner are not necessarily experts, both, however, have the necessary fundamental knowledge, and given special instruction and a certain amount of experience each should be able to acquire rapidly the necessary skill.

REGULATIONS RESPECTING UNSOUND MEAT.

The value to the community of regulations would obviously depend upon the skill of the executive officers, and the energy displayed by local authorities in giving effect to them, but even with the best organisation some unsound meat would escape notice. That this need not be a large proportion is proved by experience in the examination of imported meat.

In practically all meat-exporting countries regulations have been framed to guide inspectors who generally are appointed by the respective Governments. Regulations exist in Australia, New Zealand, Argentina, the United States of America, Holland, and other places. A considerable amount of carcass meat from these countries passes through London, and at Smithfield Central Market probably more is cut up on a limited area than anywhere else in the world. The cutting-up process brings to light hidden defects and the experience gained there is of interest.

The amount of tuberculous meat discovered at Smithfield among the South American imported carcasses during the four years 1912–15 is set out in Table II.

TABLE II.

Year.	Amount received in tons.	Amount condemned on account of tuberculosis.
1912	140,179	43 hindquarters, 8 forequarters, and 25 pieces.
1913	154,503	27 hindquarters and 10 forequarters.
1914	143,910	34 hindquarters and 11 forequarters.
1915	92,212	26 hindquarters, 5 forequarters, and 2 pieces.

The totals condemned are insignificant and do not much exceed what might be expected from ordinary defects of administration. They do not include any meat condemned other than for tuberculosis. That this freedom of the carcasses from tuberculosis is not due to absence of disease among the stock will be gathered from the fact that Mr. T. Dunlop Young,[4] reporting on the subject of Argentine meat as a result of a visit to that country with the authority of the Corporation of London, states that during 1912, of 1,368,000 cattle slaughtered at the Frigorificos, and mainly for export, 4 per cent. were affected with tuberculosis, a total which would exceed 54,720 cattle.

Some figures are also available respecting Dutch pigs, and though they are incomplete they support the present contention. In a period of nine weeks 43,330 pigs, or about one-sixth the total received at Smithfield, were specially reported upon. Among these, 39 carcasses were seized. None of these seizures were necessary on account of tuberculosis, 9 were rejected on account of decomposition, 1 for hæmorrhagic spots, and 29 for other reasons not associated with disease. Five carcasses from this consignment had already been seized at the Port for reasons which could not be then ascertained, but assuming these were on account of disease the total is not large and tends to prove that inspection carried out on formal lines, though not resulting in absolute perfection, brings about the elimination of much animal food unfit for human consumption.

These results, both as regards the carcasses of oxen and pigs, are much better than would have been observed among an equal number of home-killed animals, and this is due mainly to the differences in inspection and to the greater uniformity of action which follows the discovery of unsoundness where regulations are in force.

The Three-Standard Basis of Meat Inspection.

In framing regulations there would result certain marked differences between those of this country and those in operation in other European countries and in the United States. A two-standard basis has always been the first principle of our meat inspection work, whereas in other European countries there is a three-standard basis, and in the United States there are the first elements of a third-standard superimposed on the general two-standard. In this country meat is either fit for human consumption or it is not; but on the continent an intermediate grade of non-marketable meat exists, and provision is made for the sale of some of this meat, subject to its being sold under declaration, and either with or without its first having undergone some approved form of treatment. In the larger towns the intermediate grade is sold only after it has been treated by boiling, steaming, the removal of fat and destruction of the rest of the carcass, pickling, or freezing. By this means the flesh of selected animals which have suffered from varying degrees of tuberculosis, swine fever, swine erysipelas, certain febrile conditions, measles, &c., is rendered safe for human consumption.

In the United States flesh from a tuberculous carcass which is regarded as being affected in a degree intermediate between that requiring total condemnation and that which justifies a carcass being regarded as fit for human consumption may be passed for sterilisation after removal of the affected portions. Meat passed for sterilisation may only be sold for human consumption under declaration. The carcasses may be rendered into lard or tallow, or if not so treated may be sterilised and used for food purposes, but presumably only as canned meat, and provided the container is plainly and conspicuously marked so as to show that the product is second-grade class or quality, and has been sterilised. Provision also exists for the use of beef and pork showing a certain degree of measles, and of carcasses affected to a minor extent with swine fever.

It is doubtful whether any except the two-grade standard would be acceptable in present circumstances to the inhabitants of this country, and as regards details, definite rulings could easily be laid down which would be generally acceptable in the majority of defects. Consideration would, however, require to be given to decisions which would be necessary in special instances, such as actinomycosis of ox heads, particularly when the tongue is free, and the disease localised and without suppurating fistulous tracts; immaturity in calves; jaundice; new growths; and parturient animals. These are quoted as examples, but perhaps the most important requirement is that of guidance in connexion with tuberculous lesions in both the ox and the pig. The subject merits detailed consideration.

THE TUBERCULOSIS PROBLEM.

It has already been shown that tuberculosis is the reason for condemnation of a large proportion of the organs of slaughtered cattle, and similarly it is the chief cause of

[4] Report to the Sanitary Committee of the Corporation of London, by T. Dunlop Young, M.R.C.V.S., veterinary surgeon, on his visit to the frozen meat establishment in the Argentine Republic.

condemnation of whole carcasses. Out of a total of 68,438 animals slaughtered at Aldgate, the carcasses of 341 were totally condemned, and of these the reason was tuberculous affection in 319, or 94 per cent. Among 50,288 calves, 139 carcasses were condemned, of which 41, or 30 per cent., were on account of tuberculosis.

A division of the animals affected with tuberculosis is of interest, and Table III. shows the high incidence of the disease on cows, in which animals it amounts to over one-third:—

TABLE III.—*Incidence of Tuberculosis in any degree on Animals Slaughtered at Aldgate.*

—	Number slaughtered.	Number affected with tuberculosis.	Percentage affected with tuberculosis.
Bulls	2,565	381	14·9
Cows	4,434	1492	33·7
Heifers	1,079	68	6·4
Oxen	48,953	1872	3·9
Calves	39,333	121	0·31

The degree of affection is shown to some extent by comparing the percentage of total condemnations of carcasses to numbers affected with tuberculosis (Table IV.).

TABLE IV.

—	Total No. of animals affected.	Instances in which the whole carcass was condemned.	Per-centage.
Adult bovines ...	3813	319	8·4
Calves	121	41	33·9

Although more fully developed animals were affected with the disease than were calves, the latter showed a higher percentage of dissemination than the former.

The Question of Framing of Satisfactory Regulations.

The guiding principles regarding the action which shall be taken in the case of tuberculous meat are laid down in the recommendations of the Royal Commission. A considerable want of uniformity is, however, observed throughout the country, which is due in great measure to the fact that the recommendations are only suggestive, and therefore allow scope for the exercise of personal opinion. This divergence of views has been objected to in the past by traders, but has been tolerated. Probably the very low cost of meat has contributed to the tolerance under protest. Indications are not wanting, however, which suggest that meat may have touched the lowest point in price, and that possibly the increase in price observed in recent months will be permanent if only in part. The first result of such increase will be that the condemnation of a carcass will be of greater import financially than formerly, and differential treatment will have a more marked effect. The increased value of the carcass will also encourage deceit, to meet which more complete arrangements for inspection will be necessary.

The problem of framing entirely satisfactory instructions in the case of tuberculous meat is not an easy one, as will be gathered from a consideration of the subject.

When an animal has been successfully invaded by the tubercle bacillus two conditions at least result from the development of the disease: the function of the affected organ is diminished in proportion to the extent of the lesion, and the constitution of the animal is prejudiced as a result of the absorption of poisonous products gaining access to the blood stream from the lesion. Further progress results in the specific organisms getting free from the original site of infection and ultimately gaining access to the blood stream. If the number of organisms is small, possibly they are destroyed, but if large, and particularly if frequently liberated, they reach other organs where some are embolically removed and give rise to characteristic lesions. Those which escape a particular organ may be arrested in another organ or be destroyed in the blood. This extension of infection results in an increase in the severity of symptoms. It is obvious that the animal should be regarded as diseased from the time of infection. The disease is, furthermore, one to which human beings are liable, and it becomes therefore a matter for consideration whether the flesh of animals so affected shall be prohibited for human consumption, either because it may transmit the disease to persons partaking of it or because the flesh takes on qualities which may render it of low nutritive value, or because some quality may have been imparted to it, other than that of direct disease transmission, which may prove prejudicial. Even if all these possibilities exist it is clear that there are degrees of risk, varying between that resulting from the earliest infection to that which follows the more developed and multiple lesions.

In the latter case there can be no doubt about the unsuitability of the carcass for human consumption, but in the former the risks and other objections may be so slight as to be negligible. The recommendations of the Royal Commission approve the principle that there are degrees of tuberculous infection which do not necessitate destruction of the whole carcass, but it is obviously impossible to indicate with absolute precision the point at which a carcass becomes unfit. That being so, and the view being held that the risk may only be disregarded in certain degrees of infection, it becomes necessary, if a rule is to be framed, that it will relegate the uncertain cases to the group which is regarded as definitely harmful, so that the consumer may have the benefit of any doubt. The recommendations of the Royal Commission are as follows:—

1. When there is miliary tuberculosis of both lungs.
2. When tuberculous lesions are present on both the pleura and peritoneum.
3. When tuberculous lesions are present in the muscular system, or in the lymphatic glands embedded in or between the muscles.
4. When tuberculous lesions exist in any part of an emaciated carcass.

} The entire carcass and all the organs may be seized.

5. When the lesions are confined to the lungs and the thoracic lymphatic glands.
6. When the lesions are confined to the liver.
7. When the lesions are confined to the pharyngeal lymphatic glands.
8. When the lesions are confined to any combination of the foregoing, but are collectively small in extent.

} The carcass if otherwise healthy shall not be condemned; but every part of it containing tuberculous lesions shall be seized.

In view of the greater tendency to generalisation of tuberculosis in the pig we consider that the presence of tuberculous deposit in any degree should involve seizure of the whole carcass and of the organs.

Generalisations as to Mode of Extension of Infection.

Principles would form a better basis of action than detailed statements, provided competent inspectors existed to interpret them, and the following generalisations, which have some bearing on the case, may be briefly considered.

Infection may reach the system through the respiratory or digestive tracts, and less frequently by the generative organs or as a result of inoculation through the skin. Instances of congenital infection are also met with.

Having gained access to the system, further extension may take place by way of the lymphatic system, or the blood stream, or both. Tuberculous discharges thrown off by the animal from the seat of infection may also infect more distant mucous surfaces, as, for example, the urinary tract below the kidney from urine secreted by a tuberculous kidney, and the larynx or intestines by infected sputum thrown off from a tuberculous lung.

In the case of extension along the lymphatics it seems unlikely that much extension, if any, can take place in a direction opposite to that of the lymph-flow, which is from the organ drained to the corresponding gland, and from the gland to the central lymph channels[5]—the thoracic duct on the left side and the main lymphatic duct on the right side. Infection of healthy glands away from the original infecting lesion may result as a consequence of being placed along the line of lymph-flow and receiving infected lymph. In certain instances it is not always possible to assert confidently that one gland has infected another or that the flow in the smaller lymph-vessels is invariably in one direction. This is due to the fact that the exact area drained by certain glands cannot be stated with absolute certainty, and also that there are most numerous anastomoses between lymph-vessels in fairly well-defined areas. Take, for example, the glands draining the throat and neck. In this case the share taken by the submaxillaries, parotids, retro-pharyngeals, and

[5] Professor T. H. Wooldridge informs me that, in general, he agrees with the proposition that extension by lymphatics is in the direction of the lymph current, but his observations lead him to believe that in the case of tuberculosis of the udder, the mammary gland may be infected in a backward direction from the supra-mammary glands. The reasons are mainly physical and need not be further discussed here.

the remaining cervical glands cannot be stated otherwise than in general terms. These glands also have many intercommunicating channels. From this it follows that one or more glands may be infected from a common source of infection, and no deductions can be drawn with certainty as to the sequence. Fortunately, it is practically never necessary for a meat inspector to make such a fine distinction. Similarly in the case of the lumbar glands: these receive lymph from practically all the glands which drain the abdominal cavity and the muscular and bony structures of the abdominal walls and of the hind extremities, so that infection of them would, if considered alone, be unproductive of suggestion as to the original seat of infection.

On the other hand, there are glands respecting which a fairly positive statement may be made that lymph entering them has been received from a well-defined area, and if such a gland shows a tuberculous lesion that the infection was derived from the area drained. Such glands are those connected with certain organs, particularly the portal gland, the renal gland, and the internal inguinal or supra-mammary gland, according to sex. There are others which receive lymph only from the muscles, bones, and joints of the extremities—e.g., the prescapular, the precrural, and the popliteal—and infection of these has a similar definite significance.

Obstruction to the flow in a system with marked anastomotic features will therefore, on occasions, show almost unexpected variations to improve any impaired efficiency. For example, the lymph of the pleural region normally reaches the main lymph channel either direct or through the prepectoral glands, but, as pointed out by Buckley and Castor,[6] in case of obstruction the lymph-vessels may become fused with deep-lying lymph-vessels on the pectoral wall, and these in turn pass over the shoulder to the prescapular glands. This is a roundabout course, and probably rarely, if ever, happens, but it serves to illustrate the point that surprising variations in flow may be noticed and infection be transferred to unexpected situations. Another example, but as a normal condition, is found in the case of the pig, in which animal (and perhaps also in cattle), a small part of the fundus of the stomach drains into the splenic gland, from which it will be gathered that tuberculosis of the spleen may cause lesions in one or more of the multiple gastric glands without the stomach being the seat of origin.

The venous blood stream receives infection from infected lymph which enters by way of the thoracic duct or right lymphatic channel, or by the infection gaining direct entrance through the erosion of a vein which has become implicated in a tuberculous process, either within a gland or otherwise.

Having reached the blood stream, the bacilli are conveyed to the lungs (except in the case of the portal system to be mentioned later), and from thence may pass into the arterial blood stream to reach other organs. The organs apparently do not show uniformity in results. The lungs are most generally affected, as would be expected, and the next most frequently the liver. The spleen[7] and kidneys may be affected, but the latter more frequently. Muscular tissue rarely shows lesions, whilst bony structures are much more frequently affected in pigs than in cattle. The brain and spinal cord are infected from the blood stream. The reasons for the differences in glandular structures may be found in the varying amount of blood transmitted to them, differences in the speed of flow, and perhaps the action of the gland contents on the organism.

The blood itself seems able to get rid of organisms or to destroy their pathogenicity in a few days, as has been shown by McFadyean and others, and in this the filtering action of the various glands assists, but there is also a direct lethal effect, and probably excretion is not a negligible factor.

[6] Buckley and Castor: Lymph Glands of Food-Producing Animals. Twenty-seventh Report of Bureau of Animal Industry.

[7] The substance of the spleen rarely, if ever, develops lesions in cattle infected after the calf age.

LECTURES FOR WOUNDED SOLDIERS.—The Victoria League has done good service in organising lectures to soldiers in hospitals, and an appeal is being made for £500 in order that the scheme may be considerably extended. The work is supplementary to that undertaken by the Y.M.C.A. and the Workers' Educational Association. Contributions should be sent to the honorary treasurer, 2, Millbank House, Westminster, marked "Hospital Lectures Fund."

A CONTRIBUTION TO THE MICROSCOPICAL HISTOLOGY OF MALARIA,

AS OCCURRING IN THE SALONIKA FORCE IN 1916, AND A COMPARISON OF THESE FINDINGS WITH CERTAIN CLINICAL PHENOMENA.[1]

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Scope of Investigations.

THESE investigations were undertaken for the purpose of ascertaining the cause of death in some of the rapidly fatal cases of malaria. Also whether the lesions produced were more severe than those already recorded in the history of this disease, and more especially, if any facts could be obtained to explain the sudden death which has occurred, and the observed frequency of cardio-vascular phenomena. The cardio-vascular symptoms have been carefully studied by our French colleagues among the troops of the Levant Army, so that it may be taken as an accepted fact that these cardio-vascular phenomena have been of frequent occurrence among the troops of the Allied Armies.

These observations include the investigations of the cerebrum, cerebellum, medulla, heart muscle, adrenal glands, liver, spleen, kidneys, and intestinal tract from cases which died in coma, those who died quite suddenly, and those who died with general malarial toxæmia. A case of malaria which succumbed to blackwater fever is included as the examination of the tissues in this case serves as a valuable contrast with the other cases of malaria.

A special investigation of the adrenal glands has been made from some cases of malaria which died in one of the General Hospitals.[2]

The tissues were fixed in 10 per cent. formaldehyde in normal saline (in a few cases 50 per cent. spirit was employed) and also potassium bichromate. The tissues were stained for fat with Scharlach R., and as a general stain hæmatoxylin was employed and also iron hæmatoxylin, while for certain features which were specially required to be developed the staining with hæmatoxylin was modified in certain details. Staining for Nissl granules, Van Gieson's stain, Giemsa's stain, and Leishman's stain and staining of the tissues for free iron were employed. Strengths of hydrochloric acid varying from 2 per cent. to 25 per cent. acting at 37° C. were used for testing for the presence of free iron.

It has been noticed during this epidemic of malaria in the Salonika Army that sudden death was not uncommon, and the committee[3] which was appointed to inquire into and report on the fatal cases of malaria which occurred in the Salonika Army noted that a large proportion of the cases died within 24 hours and no less than 57 per cent. died within the first two days of admission to hospital. Further, collapse and even sudden death occurred as an initial phenomenon of the disease in this epidemic.

Now before the microscopical findings are referred to, attention must be drawn to another factor which has been considered in relation to the death-rate—viz., the high temperature this summer. As far as these results are concerned, every fatal case which has been investigated died after August 8th, while the intense heat was previous to this date. This point is only mentioned because of the importance which some have attached to the temperature experienced by the troops this summer.[4]

Heart Muscle.

It is now definitely known that the most important cause of death in acute diphtheria is fatty degeneration of the heart muscle and, to some extent, of the diaphragm. At the

[1] A paper read before the Salonika Medical Society.

[2] We are specially indebted to Captain Richards, officer in command of the laboratory of this hospital, for his assistance with the examination of the adrenals.

[3] The committee consisted of Colonel Stewart, C.B., Lieutenant-Colonel Aldridge, C.S.I., C.M.G., Lieutenant-Colonel Lionel Smith, and Lieutenant-Colonel L. S. Dudgeon.

[4] Manson and certain other writers consider that "heat-stroke" simply means "syncope," caused by heat alone or a combination of heat and lowered bodily resistance.

suggestion of Dr. Foord Caiger, one of the most distinguished authorities on specific fevers, examination of the heart muscle from fatal cases of diphtheria in the acute stages of the disease was undertaken by me.[5] It was shown that the heart muscle, and often the diaphragm, undergoes fatty degeneration which is the cause of sudden death in the early stages of this disease. Experimentally fatty changes in the heart muscle and diaphragm of rabbits and guinea-pigs poisoned with diphtheritic toxin were induced within a few hours.

It is recognised that absolute rest is a cardinal rule in acute diphtheria because of these changes which the heart muscle undergoes.

Examination of the heart muscle in six cases of malaria showed fatty degeneration in each instance, and in five out of the six cases diffuse fatty change similar in all respects to that which is found in acute diphtheritic toxæmia occurred. In the one exceptional case referred to this degeneration was irregular in its distribution, but the heart muscle was obtained from a case of sudden death. In the muscle cells the fat is present chiefly as fine droplets, but medium-size and large droplets are seen which again simulates the fatty change in acute diphtheritic toxæmia. This fatty degeneration of the heart muscle, using the term in the sense which modern teaching directs, is of the utmost importance in the therapy of malaria.

In addition to the fatty degeneration, blocking of the capillaries with infected red cells is present in most instances. This appearance of the heart muscle, which, apart from affording such a striking feature to the microscopical specimens, no doubt plays a rôle in the etiology of fatty degeneration of the muscle wall.

These results afford a satisfactory explanation for the sudden collapse and death which, as already stated, has occurred during this epidemic. As in diphtheria, so in the treatment of severe malaria every effort should be made to protect the heart from undue exertion as far as this is possible under the prevailing circumstances.

Adrenals.

The microscopical changes in these glands are very numerous, and in some respects the appearances are similar in all the glands examined. The most constant alteration from the normal histology is the diminution in the lipoid substances which give such a characteristic appearance to the normal gland. The loss of lipoids occurs in all layers of the cortex, although this effect is much more obvious in some areas than others. In every gland examined lipoid substances can be demonstrated, but by comparison with the normal adrenal the loss is often considerable, and in 11 specimens out of 12 which have been examined there are large areas of cortical tissue in which the lipoid content is reduced to a minimum.

The chromaffin substance in the medulla is also greatly reduced in amount as far as can be demonstrated by microscopical methods, so that in some of the adrenals the chromaffin, although deficient, can be recognised in the cells of the medulla; in other glands it is a matter of considerable difficulty to find this pigment.

Elliott,[6] in his monograph on the adrenal glands, states that he regards the chromaffin reaction as unreliable in adults, so that it is quite fallacious to estimate residual adrenalin with the depth of staining of the tissues. For accurate work he considers that the adrenalin must be extracted from the gland and its amount determined by quantitative methods. Among his conclusions, Elliott makes this statement: "The adrenalin is lessened in many infective diseases, but probably not to such a degree as to endanger the circulation."

In many of the adrenals the deep cortical pigment is found to be abundant.

Malarial pigment is present in each specimen which has been examined, and can be easily recognised, as is the case with this pigment in other organs. It is found free, lying in the adrenal cells, in spider cells from the connective-tissue framework which bounds the glandular tissue, and in large mononuclear cells in the sinuses. Vacuolation of the cortical tissue is apparent in many of the specimens and also areas of necrosis, but these changes vary in the specimens examined.

Necrosis of the cortical and medullary tissue is especially well marked in those cases in which there is thrombosis of blood-vessels. Congestion of blood-vessels is present in every case, although, as one would expect, it is much more marked in some of the glands than in others, and, further, this congestion of blood-supply is apparent throughout the cortex and medulla, and also in the capsule. In three cases the congested vessels contain numerous small ring parasites and spores in the red cells, so that this appearance gives a characteristic feature to the sections. In one case which has frequently been referred to in this report all the blood-vessels of the adrenals are congested, but many of the capillaries and arterioles are thrombosed. The thrombi contain agglutinated red cells, which are in various stages of hæmolysis, and also yellow pigment granules, free, and taken up by large mononuclear cells within the blood-vessels.

Small parasites and spores are found in most of the glands, but they are far more numerous in some cases than in others; while in one instance crescents are present, although few in number.

The free iron reaction was only demonstrated in two of the cases, and even in these the reaction was very feeble.

Hæmorrhages are present in those adrenals which show marked congestion of the blood-supply, and also phagocytosis of the red blood cells.

Paisseau and Lemaire[7] have examined the adrenal glands from cases of malaria occurring among the French troops in the Orient. The glands from three cases were submitted to careful microscopical examination, and it was found that profound changes had occurred, the most important of which were arterial thrombosis, hæmorrhages, and foci of degeneration. The cortical cells in some areas were almost completely necrosed. These observers consider that the asthenic condition met with in malaria may be accounted for by the profound changes which can be demonstrated microscopically in the adrenals, and even recommend the employment of adrenalin for such cases.

Further, Monier-Vinard has also drawn attention to the low blood pressure noted from daily observations in numerous cases of malaria occurring among the French troops.[8] Not only are the cardio-vascular lesions sufficiently serious, but the widespread changes found in the internal organs afford abundant evidence of a severe general toxæmia.

Brain.

The cerebrum, medulla, pons, and cerebellum have been examined from three cases,[9] and in all three the lesions are both severe and widespread. In each case the patients died in coma. It was noted at the time of the examination of the brain that thrombosis was present, and that it was more especially marked in the white matter. It was a matter of considerable difficulty to disengage the clots from the vessel walls, and while in one case no parasites could be found in the red cells from the clot, yet in the other specimens parasites were abundant.

The microscopical appearances will be described separately, as in one case parasites could not be detected in any of the specimens, while in the other two cases they were present. The first case occurred in a sapper who had been energetically treated with quinine by intravenous and intramuscular injections, but died in coma as already stated. Portions of the brain tissue from various areas were examined microscopically and were found to show identical changes, so that it is sufficient to describe one area of brain tissue in detail. The capillaries are engorged with blood, as also the arterioles, while many of the blood-vessels are thrombosed and the thrombi are composed of agglutinated red cells, partially hæmolysed red cells, and blood pigment. This pigment is taken up by the endothelial cells which are found lying free in the lumina of the vessels.

It also appears that the vessel walls are themselves more prominent than from the cases to be described, although there is no evidence of inflammatory reaction. Smear preparations of blood clot made soon after the autopsy failed to show any parasites, while careful examination of numerous sections of the brain have led to a similar result.

The cerebral tissue itself shows the effect of these changes, as the nerve cells have undergone all forms of cell degeneration in the specimens which were prepared for that purpose. Some of the cells are nuclear-free; in others the nuclei are eccentric. The cell granules are either absent or present in very deficient numbers, and while some of the cells are swollen much above the original size, others are shrunken.

In the other two cases the microscopical changes are very similar, whether the portions of tissue examined have been taken from the medulla, cerebellum, or cerebrum, and thrombosis was very readily recognised at the autopsy. The vessels are engorged with blood and a large proportion of the red cells in the capillaries and arterioles contain engulfed parasites which are present in the form of rings or dots. Some of the capillaries show as many as 100 per cent. infected red cells, while it is uncommon to find less than

[5] Leonard S. Dudgeon: The Pathology of Acute Diphtheria Toxæmia, Brain, 1906.

[6] T. R. Elliott: Pathological Changes in the Adrenal Glands, Quarterly Journal of Medicine, October, 1914.

[7] G. Paisseau and H. Lemaire: Accès Pernicieux Palustres Surrénalites Aigues, Bulletins et Mémoires de la Société Médicale des Hôpitaux de Paris. (Séance du 20 Octobre, 1916.)

[8] Quoted by MM. P. Armand-Delille, G. Paisseau, and H. Lemaire: Le Paludisme de Première Invasion observé en Macédoine pendant l'été 1916. Extrait des Bulletins et Mémoires de la Société Médicale des Hôpitaux de Paris. (Séance du 13 Octobre, 1916.)

[9] From material recently obtained from a fatal case of malaria, the retinal and choroidal vessels, and the blood-vessels in the optic nerve contain numerous infected red cells, while some of the vessels in front of the eye are blocked with infected red cells.

70 per cent. of the red cells in a vessel containing parasites. The black pigment of malaria is present and not the brownish-yellow pigment resulting from the action of hæmolysis; in fact, pigment other than the true malarial pigment can be disregarded in the specimens from these two cases, with the exception of the yellow pigment present in the nerve cells in this and many other conditions. Vascular thrombosis is present in both the white and grey matter, but more marked in the white matter. There is complete absence of perivascular inflammation throughout the brain tissue. The nerve cells show all stages of degeneration, from the cell merely represented by "wall outline" to the apparently healthy cell.

By comparison it can be readily appreciated that the changes in these two classes of cases, which may have been to some extent similar on clinical evidence and which died in coma, yet differ widely in their microscopical characteristics. In both varieties thrombosis of blood-vessels has occurred, engorgement of vessels and nerve-cell degeneration, but while in the two cases the vascular phenomena are those which have been widely described in fatal cerebral malaria, yet in this one case the vascular changes which are present do not suggest that the malarial parasite was the etiological factor in the fatal issue. There is evidence of a toxin (apart from the plasmodium) acting on the red cells and tissues throughout the body. In the splenic films of this case parasites were not found, although during life one ring form was seen. A general vascular thrombosis has occurred with destruction of blood in the vessels. That this condition may have been induced by too active treatment with quinine seems to us extremely probable, although absolute proof-positive evidence cannot be established. In the two typical malaria cases vascular thrombosis is present as a widespread lesion, but due to the blocking of the vessels with infected red cells.

While referring to the microscopical changes in the brains in our cases of coma, it is of importance to consider the work which has been recently recorded by workers in the laboratories of the Levant Army under Dr. Armand Delille. The cerebro-spinal fluid was examined from 33 cases of malaria, both with and without symptoms suggesting a lesion of the central nervous system, by Monier-Vinard, Paisseau, and Lemaire. In 10 cases the fluid was found to be normal, but in 23 cases, of which a certain number were suffering from violent headache, delirium, convulsions, and coma, the cerebro-spinal fluid was shown to contain a marked increase in the number of lymphocytes and an increase in the protein content.[10]

Spleen.

The changes found on microscopical examination of the splenic tissue are very numerous and most interesting.

There is congestion in all cases, free hæmorrhages are present in some, while in several instances necrosis of the splenic pulp has occurred. This necrosis affects chiefly the pulp, but there is some necrosis of the Malpighian corpuscles in a few instances, while in the case of blackwater fever[11] the necrosis of the Malpighian corpuscles is the most striking feature. These necrosed corpuscles showed considerable enlargement on naked-eye examination, and it therefore appeared probable that the enlargement was due to activity in these centres. In this case, however, the enlarged corpuscles consisted of necrosed endothelial cells, while the lymphoid cells, which give the appearance to the healthy corpuscles, are few in number.

In all the malarial spleens examined the areas of necrosis contain black pigment. In one case infarction of a large area of splenic tissue had occurred, which had all the appearances of a typical infarct. Microscopical examination of the spleen in this case showed congestion of the splenic tissue adjacent to the infarct, and here red cells containing either rings or dots are very abundant and also free and engulfed malarial pigment, while in the necrotic tissue parasites are very scanty, even in the few red cells which have escaped autolysis. Pigment in the infarcted area is also very scanty.

Thrombosis of the capillaries and arterioles in many of these cases is a striking feature. This thrombosis is similar to that which is figured in some of the cerebral specimens, and the red cells which are present in the thrombi are heavily infected with parasites. It is in those specimens in which thrombosis of vessels is present that foci of necrosis predominate. Pigment is present in abundance in most cases, but, like the pigment which is found in other tissues, it has little tendency to give a free iron reaction. This pigment (fine, medium, and coarse) is found free, in the mononuclear cells and small giant cells in the sinuses. Phagocytosis of red cells is present in all the specimens in excess of that which occurs in the spleen in non-infective conditions; in some cases the red cell phagocytosis is very marked. Crescent parasites were only found in three cases, while other forms of parasites were found without difficulty in all cases but one. The splenic sinuses may be very much distended, although the walls can be readily recognised, while in other areas in the same specimen the congestion of the sinuses is such as to render the outline indistinct.

Evidence of amyloid degeneration, either in the central bodies or in the splenic pulp, is wanting in every case.

Liver.

The hepatic changes are numerous, but the deposit of pigment, which has long been regarded as one of the most constant characteristics of the malarial liver, is present in every case. This black pigment is found lying free in the sinuses and also in cells in the blood spaces. It is engulfed by large mononuclear cells from the sinus walls, in spider cells, and cells which closely simulate detached liver cells. Free iron is present, but the reaction without exception is very feeble, while some liver cells contain yellow pigment in fine dots.

Fatty change is present, but it is only in a few cases that the fat droplets are abundant. In the one case of blackwater fever the fatty change is very marked, but it is limited to the central zones, which consequently are beautifully mapped out by this degeneration. Necrosis of liver tissue in isolated areas is of common occurrence, and the focal necrosis is similar to that which occurs in many infections. In the case of blackwater fever the necrosis is well mapped out in the central zones of liver tissue in which the fatty "degeneration" occurs, while free nuclei are found here together with polynuclear leucocytic invasion of the necrotic tissue. In the other cases of malaria this central necrosis of liver tissue has occurred, but to a less extent. Parasites are found in the red cells in the sinuses and in the blood-vessels, while the vessels in a section of the liver which shows thrombosis contain numerous infected red cells in the thrombi, and also a few crescents. It can be taken from these observations, however, that the invasion of the liver with infected red cells is not such a striking feature as is seen in the spleen, brain, and heart muscle. There is no evidence of amyloid disease in any case.

It is important to note that the bile was examined from some of the fatal cases of malaria by Captain Clarke and found to be sterile, and Captain Clarke and I examined 35 cases of malaria, at a mobile laboratory, and in every instance the blood was found to be sterile. Captain Elworthy, officer i/c of one of the laboratories in Salonika, made blood cultures in 18 cases of proved malarial fever, with negative results in each instance, while samples of bile from eight cases of fatal malaria and cultures of the spleen from six cases were found to be sterile.

These bacteriological results are important, as it might be suggested that some of these pathological findings were induced by bacilli of the enterica group acting on the liver tissue. Bacillary dysentery is the only other probable bacterial infection which might account for some of these changes, but no dysenteric symptoms are recorded and ulceration of the bowel was not found in any of these cases in which the liver was examined microscopically. It is necessary, however, in the Balkans, as it was on Gallipoli, fully to realise the possibility of double infections.

Kidney.

The microscopical examination of the renal tissue has shown that certain changes in the kidney are similar to those already referred to in the account of the other viscera. Fatty degeneration of the renal epithelium has occurred in several specimens, especially in that of the convoluted tubules, while in some cases the vessels are thrombosed in various areas, and here foci of necrosis occur. In two cases the kidney changes are widespread. Diffuse nephritis is present on microscopical examination of one of these cases, and during life the man had suffered from subtertian malaria, finally succumbing to the effects of acute nephritis. The renal changes are extreme and the lesions are widespread. The tubules show the most marked changes, which include fatty and other degeneration of the tubular epithelium and obstruction of the lumina of the tubules by blood casts and epithelial products, while in addition there is exudation into the glomerular tufts.

In the other case the patient died of blackwater fever. There is extreme degeneration of the whole renal tissue, but fatty change is more marked in the products of degeneration in the tubules than in the degenerated epithelial cells lining the walls. The lumina of the tubules are blocked by (1) clots chiefly consisting of red cells and red-cell débris, (2) coagula of blood serum, (3) thick granular deposits. The epithelial cells of the tubules which themselves show all possible degenerative changes have been widely shed into the lumina of the tubules. Some of the blood-vessels are filled with blood serum, while the capillaries of the glomeruli are engorged with red cells and red-cell débris. Some vessels contain definite thrombi of agglutinated red cells. There is

[10] MM. Monier-Vinard, Paisseau, and Lemaire: Extrait des Bulletins et Mémoires de la Société Médicale des Hôpitaux de Paris, Séance du 20 Octobre, 1916.

[11] The microscopical changes are those of a severe toxic action on the various tissues of the body, and not dependent on the mere hæmolysis of red cells.

no inflammation of any portion of the renal tissue. The free iron reaction is very slight.

Intestines.

There is the only case, apart from those cases of proved bacillary dysentery associated with malaria, in which the intestines were examined microscopically. Considerable congestion of the vessels in the mucous and submucous layers of the gut is manifest, and numerous parasitic red cells are found in the vessels. Necrosis of the mucosa has occurred at various points, but there is no inflammation of the bowel wall to suggest a reaction from a bacillary infection. There are large areas of degeneration present with replacement of the muscular coat by mucoid tissue. This patient had not suffered from diarrhœa, and there was no history that he had passed blood or mucus; ulceration of the bowel wall, although present microscopically, was not observed at the autopsy, but the intestine from this area was deeply stained with bile. Whether this case is an example of necrosis of the bowel wall due to malaria, or an undiagnosed bacillary dysentery, is open to question, but against the latter view is the absence of evidence of inflammatory changes in the intestinal wall.

Causation of the Drastic Changes in the Tissues.

There is no question that the effects produced on the tissues in these cases of malaria which we have examined are widespread. Further, no other disease with which we are acquainted could have produced more drastic changes in the tissues. The rapid progress of the infection in so many cases on the one hand, and the cardio-vascular phenomena on the other, have led "some" to believe that this outbreak of malaria is different from all others.[12] It has been suggested, as one would expect, that this difference depends on the virgin soil which has been placed at the disposal of the parasites, or on the parasites, or on the quinine.

Special differences as regards the parasites must be left to the decision of those who have advanced this view. We cannot do better, however, than quote the remarks made by Sir Ronald Ross on this question. He says:—

Some authors consider that there are two, if not three, varieties (or ? species) of malignant parasites. I am inclined to agree with them, but have not yet satisfied myself on the point sufficiently to admit it in my classification.[13]

When we come to the question of quinine it is necessary to remember that the treatment of malaria depends on so many factors besides the mere administration of the drug that each of these should be considered on its own merits, more especially in relation to the fact that we are dealing with an army exposed to exceptional conditions of active service. As regards the toxic effect of quinine on the cardio-vascular system it is stated by Manson that it may produce depression, gastric disturbances, and even death from syncope. Professor A. R. Cushny, in a letter to me on this subject, states that he cannot supply any data to support the view that quinine is a cardio-vascular poison, but, on the other hand, he emphasises that as the drug has been used so extensively and under such special circumstances our views may have to be modified. These remarks by Professor Cushny, together with the views of those who have had wide experience of the successful treatment of malaria with quinine, seem to us to afford no evidence that quinine correctly administered is able to provoke such widespread toxic action on the tissues of the body.[14] It has to be remembered that our French colleagues consider that the cause of these various effects on the tissues is due to the action of the malarial parasites; a view which has abundant evidence to support it.

Blocking of Blood-vessels in Malaria.

Complete or partial occlusion of blood-vessels with red cells heavily infected with parasites has long been known to occur in malaria. Bass and Johns offer an explanation for this phenomenon, which is as follows:—

The substance of malarial plasmodia is very different in consistency from that of red blood cells, and therefore they cannot pass through the smallest capillaries like the more yielding fluid-like red cell. That the consistency of the protoplasm of the parasite is less yielding than that of the red blood cell is shown by the fact that when a small quantity of a culture containing large parasites is spread over a slide with the end of another slide, the parasites are dragged to the end of the spread, though the red blood cells are left behind.

This observation, however, refers to the smallest capillaries which are obstructed, while as a matter of fact it is not only the smallest but the large capillaries and arterioles which are plugged, and this vascular obstruction would seem to be most marked in the brain, spleen, and heart muscle. Heavy infection of the red cells with parasites will assist in obstructing the blood-supply by mechanical means quite apart from the general toxic action on the tissues and endothelium of blood-vessels; fatty degeneration of the heart muscle must lead to diminished blood pressure; while the changes in the adrenals are also of importance in this direction. It would appear probable, however, that blocking of blood-vessels with heavily infected red cells may be a temporary condition apart from the serious pathological lesions, thrombosis and embolism, while there is little doubt that obstruction of the blood-supply to the tissues in malarial fever is dependent upon many factors.

[12] It would be as well for all who believe this to be the case to study the work of Sir Ronald Ross on "The Prevention of Malaria" and the article on Malaria by Major Christophers, "Flies and Disease," by Edward Hindle. Cambridge, 1914.

[13] Ross: The Prevention of Malaria, p. 89

[14] Baermann reported in 1909 a death due to two doses of 0·5 gm. quinine hydrochloride—collapse, blood in dejecta, extravasation in organs. Quoted from "Prevention of Malaria, p. 136, by Sir Ronald Ross.

TREATMENT OF TUBERCULOUS EYES BY LOCAL APPLICATION OF TUBERCULIN.

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DURING the investigations into the cutaneous reactions of tuberculin, recorded in the article "Diagnosis of Tuberculosis by Tuberculin," published in THE LANCET (Oct. 7th, 1916), and certain other investigations into tuberculin reactions on lupus, not yet published, there arose a strong conviction that some form of local application of tuberculin would be the right way of treating the tuberculous conditions affecting the superficial tissues of the eye.

Up to the present the treatment of tuberculous eye conditions has been rather unsatisfactory, not only because of duration of the disease, but also on account of its great tendency to relapse. There has also been considerable difficulty in recognising which conditions were due to tuberculous infection and which were not.

Extent of Cases of Tuberculous Origin.

These tuberculous conditions seem especially prevalent in children, interfering not only with their welfare, but also with their education.

The early recognition of tuberculosis in many of the cases herein recorded was rendered possible by the systematic application of the multi-papillary-cutaneous method of diagnosis, which amply demonstrated that chronic eye affections in children were generally much more due to a tuberculous condition than would have been anticipated. In the cases observed every superficial part of the eye and appendages has been found to be tuberculously infected. The cases so far recorded have been blepharitis, phlyctenular conjunctivitis, and keratitis.

It is now routine practice to test every superficial recurrent inflammatory condition of the eyes and lids, generally with positive results, and the conclusion is being arrived at that nearly all superficial nebulæ and maculæ are of tuberculous origin. Of course, this generalisation does not include effects of superficial injuries, acute conjunctivitis, or the congestive conditions due to errors of refraction, but it is astonishing how often in the latter condition the congestion produced by these errors is complicated by tuberculosis; the error of refraction lighting up the tuberculous condition, and *vice versa*. It must be remembered that syphilitic and tuberculous eye affections may exist simultaneously. In fact, one case sent for diagnosis was undoubtedly syphilitic, but as a tuberculous reaction also occurred, the tuberculous element was treated for a short time, to the great improvement of

the subsequent syphilitic treatment, to which the case had previously proved refractory.

Up to the present, in the eye, deep tuberculous infections seem to be as much a rarity as syphilitic superficial ones are. The best demonstration of this superficiality is seen in tuberculous marginal blepharitis, where the eyelashes reappear after the cure of the tuberculous condition, though they have been absent for years.

The upper lid has only been twice found affected, and that has been on its free border. The upper sector of the eye does not seem to suffer from tuberculous invasion in the same proportion as the middle and lower sectors. This is so marked that it suggests that disease may be largely due to the deposit of tuberculous infected dust finding a lodgment in the superficial ocular tissues. There seems to be no doubt that localised tuberculosis is more prevalent, at least in its palpebral manifestation, in those whose general cutaneous hygiene is deficient. This accords with N. Bishop Harman's observation: "The dirty suffer twice as much as the clean." The large proportion of girls affected is interesting, and it suggests that the dust is domiciliary rather than external. The proportion in the cases recorded is 13 boys to 20 girls.

Results of Treatment.

Next in interest to the widespread existence of tuberculous infections of the superficial tissues in connexion with the eyes, which the use of the M.P.C. method revealed, came the further interest of the ease and simplicity of the treatment, and its almost wholly satisfactory results, leading to the publication of this article at present, instead of including it in a more complete investigation later.

All the cases so far treated have, up to date, proved curable, in any time from six weeks to three months, and so far only one relapse has occurred where the treatment has been completed, and this in spite of the fact that many of the cases have been continuously bad for years, and in some of the worst cases the complete freedom from attack has existed for over 18 months. Some of the children who are now attending school regularly have known little of school attendance before, and at present, in Middlesbrough, as far as is known, no case is absent from school for tuberculous eye conditions.

The cases treated have been mostly children, who form the large majority of sufferers from tuberculous diseases of the eye. A few adults are also included, though they have proved somewhat more refractory. They also have recovered. The total number of cases treated to date is 33, and are all recorded here, so that no selection has been made, and no case has been refused treatment.

Description of Method of Treatment.

The treatment is extremely simple and consists in instilling tuberculin into the conjunctival sac directly, in various dilutions of increasing strength. The eye thus gradually acquires a permanently raised resistance to the tuberculin poison, and so becomes no longer sensitive to local tuberculin reactions, as the result of congestive conditions produced by strain or irritation. The routine procedure is simple, and in the milder cases varies little. During the treatment the eye is kept uncovered, being only protected by a shade when photophobia is present. No atropine or other local drug is used, except where the reaction is excessive.

First in every case a cutaneous test is done on the forearm with tuberculin, using various strengths, from undiluted bovine tuberculin (P.T.O.) to 1 in 10,000 human tuberculin (T.), as explained in THE LANCET of Oct. 7th, quoted above; this is done not only to aid in diagnosis but to record susceptibility of the patient to tuberculin, a very important matter whenever tuberculin is used in treatment. Cases are by this means classified into the following definite classes, viz.:—

1. *Hypersensitive*, giving a marked reaction from IV. to VI. M.P.C., a dilution of T. from 1 in 500 to 1 in 10,000.
2. *Sensitives*, giving any reactions to III. M.P.C., or 1 in a 100 T. or doubtfully to IV. 1 in 500.
3. *Subsensitives*, giving a marked reaction to I. or II. M.P.C. original P.T.O. or 1 in 10 T.
4. *Insensitive*, either no reaction or only very slight one.

Tuberculin should be used differently in each of these types, as would naturally be expected, but in the past this phase of the question has not received sufficient attention in tabulating the result of tuberculin treatment, to the great detriment of the records and the use of tuberculin as a therapeutic agent. As a rule the cutaneous reaction in eye cases demonstrates that they belong to the sensitive and hypersensitive classes, as would be expected, since they generally belong to the group of "double infections."

All cases up to date have been treated with bovine tuberculin, ordinary P.T.O. being used in tenths. It is as well here to put on record that all brands of P.T.O. are not similar in their reaction when applied to the same case, even when they are supplied by the same firm. This is very important, as a brand should be used that has been found cutaneously active to the case under treatment, as is demonstrated by the M.P.C. It is therefore advisable to use the same or a similar bottle for treatment as is used for the cutaneous reaction, where positive.

Dilutions are made in the usual way. One part of P.T.O. with 9 parts of diluent (normal saline and ½ per cent. carbolic acid) forms Dilution 1. Then 1 part of Dilution 1 with 9 of diluent forms Dilution 2, and so on until eight dilutions have been made.

The method of recording is according to the dilution used, viz.:—

Original	=	Undiluted P.T.O.
Dilution 1	=	1 in 10 P.T.O.
Dilution 2	=	1 in 100 P.T.O.
Dilution 3	=	1 in 1000 P.T.O.

And so on to Dilution 8.

Ordinary "Sensitive" Cases.

If the case is an ordinary "sensitive," not responding to more than III. M.P.C., a start is made with Dilution 6, which is instilled into the eyes whether inflamed or not—usually one eye is inflamed at the start, the reason for seeking treatment. It is customary to instil the dilution into both eyes simultaneously, and an ordinary T. syringe is used which directs a small stream with certainty. It appears desirable to encourage engorgement of the vessels after instillation rather than not, as it is believed to stimulate the absorption of the tuberculin. No child has cried after the second instillation. The instillation is repeated every two or three days if the time is urgent, otherwise twice weekly is the usual practice. It is always advisable to see the eyes on the day following an injection to observe and record the result of the treatment, which is sometimes magical to inflammatory condition. Records should always be made, as it will be found necessary to refer back to them later in the treatment if any unexpected result arises. The object of the next day's inspection is not to note the improvement however, but to note and record the result of the reaction, if any, as reaction is the keynote of this as of all other tuberculin treatments.

Should no undue reaction occur, and even if there should be some increase of the existing inflammation, in two or three days' time the instillation is repeated, using the same dilution in the same manner. Next week, or the third time of instilling, the dilution is raised to Dilution 5, which is repeated a second time in the same manner after two or three days' interval. By the fourth instillation the inflammation is usually materially reduced or gone altogether, but that will be considered later. After the fourth instillation the dilution is again raised, and Dilution 4 is instilled twice in the same manner. The next week Dilution 3 is used. Up to this point practically no precautions are necessary in ordinary sensitive cases, as the case should show continuous improvement, and even all secondary congestion will usually by now have disappeared.

As a matter of fact, up to Dilution 3, frequently the dilutions are instilled three times a week, instead of twice, as this materially shortens the treatment, and so far no reactions have been primarily produced with a weaker dilution, except in hypersensitive cases, which will be dealt with later. With Dilution 3, however, more precaution must be observed, and instillation should never be made more often than twice a week, and the repetition of all doses is essential. This is frequently omitted in the weaker dilutions to shorten the time of treatment, when it is considered no undue risks are being incurred. Still, the duplication of the dose is the safer procedure in routine practice with those who have not learnt to differentiate the various grades of sensitiveness.

After Dilution 3, reactions occur more frequently, but not usually in ordinary sensitive cases. It is as well to use Dilution 2 three times, and after that Dilution 1 is repeated as often as necessary. A beginner is advised before using Dilution 1 (equal to 1 in 10 P.T.O.) to use Dilution 1 diluted by half its bulk in diluent (1 in 50), using this once, and if there is no reaction proceeding to Dilution 1.

Dilution 1 is now considered the end of the treatment. In a few cases original P.T.O. has been used, but this has been abandoned in routine practice as unnecessary and liable occasionally to produce an undesirable reaction, though a reaction did not necessarily follow on its use.

In hypersensitive cases Dilution 2 is often the termination of the local treatment where weaker dilutions show a tendency to produce an undue reaction, but one does not feel so safe from relapses as where Dilution 1 has been used without producing reaction. When this occurs the case can be considered permanently relieved and the patient should then

be found able to face wind and eye fatigue without any recurrence of the inflammation.

This even holds in chronic phlyctenular conditions where the refraction has not been corrected—possibly the most conclusive test of all. Needless to say, it is always well to have such errors of refraction properly corrected.

A reaction is recognised either by a fresh inflammatory patch appearing, or an increase of the already existing inflammation, or even slight local congestion in an eye previously normal. When a reaction does occur it is immaterial at what point in the series, as the treatment is similar. If the reaction is mild, wait for a few days until it has subsided and repeat the dose, making the intervals between subsequent doses longer, and raising the dilutions more cautiously, possibly repeating a dose three times instead of twice.

This is all that will be found necessary in the vast majority of cases, the treatment being carried out usually without further interruption until the safety point has been reached.

Hypersensitive Cases.

We come now to the consideration of the hypersensitive cases.

Hypersensitive cases are those giving a *marked* reaction to (IV.) M.P.C. 1 in 500 or any reaction to (V.) or (VI.) M.P.C. The characteristic of all hypersensitive cases, as indicated by their M.P.C. reaction, is their marked irritability to tuberculin; this is especially apparent in the weaker dilutions and is present both in local applications and all forms of injection. When eye cases are hypersensitive it will be found, on inquiring into their history, that their attacks of inflammation have been of longer duration and more intractable, and with shorter free intervals between the attacks, than occurs in the ordinary sensitive case. In these hypersensitive cases the instilling of tuberculin has to be done much more cautiously, since they show, as has been said, a marked sensitiveness even to weaker dilutions of tuberculin. The treatment is thus naturally much more prolonged. All signs of a reaction must be watched for and responded to more carefully. It is advisable in these cases, at least until the resulting conditions become familiar, to start their treatment with Dilution 8 instead of Dilution 6; advance must be made cautiously, but nevertheless it will be found possible to advance the dose with considerable regularity if at a slower rate than in the sensitive cases.

When dealing with a hypersensitive case after it has quieted down and a reaction is reached, sometimes a repeated dose of the same strength will give a greater reaction than the first, and the third repetition may even produce a still greater reaction. In these cases it is as well to go back to Dilution 6 or 8 and begin *de novo*, especially when the reaction is excessive and slow in subsiding. These increasing reactions are in the nature of an anaphylaxis, and on that theory were found better treated with weaker dilutions than by none at all, as a more rapid quieting down was effected. Benefit is often derived by giving small injections of P.T.O. subcutaneously and simultaneously, say, 1 10 c.c. Dilution 7 or 8 already prepared for eye instillation, cautiously raising these doses by tenths. Atropine ointment has been found materially to control the reaction even where there is no great congestion at the sclero-corneal margin, in which case it would have naturally been used in routine practice. The action of atropine also permits in these cases a more active treatment.

It will be remembered that atropine sulphate has been found to have a protective action against the asphyxia of acute anaphylaxis in the guinea-pig, and is also used with advantage in serum sickness. Hyperæmia is best controlled and the pain at the same time relieved by instilling a dilution of adrenalin and eucaine or having an ointment made. The following are the strengths used—viz., adrenalin, 1 in 2000; eucaine, 1 in 100. The writers are quite aware that the procedure is not always advisable in ordinary inflammations, especially ulcerative, but in these cases where dealing with acute hypersensitive reaction it has been found useful, but should only be used a few times.

The Production of Reactions.

In normal sensitive cases that are only sensitive to M.P.C. III. these reactions should rarely be seen, but in the hypersensitives they cannot sometimes be avoided, though as experience has grown they have become of less frequent occurrence. Really the study of reactions on the eye generally has been made during the removal of superficial nebulæ of tuberculous origin, the results of previous inflammations. In these cases a certain amount of reaction is necessary. When the removal of opacities is undertaken the treatment is best commenced while the eye is quiescent. The doses are rapidly increased until a reaction is reached, since that is what is desired, as some part of the opacity is generally removed at each subsidence of the congestive symptoms. Then the eye is allowed to rest again. If the case is not anaphylactic the reacting dose is again repeated, generally with a slighter reaction, and when this has subsided a stronger dose is given if that is found necessary to produce the essential reaction.

The removal of the opacities occurs during the subsidence of congestion, each time a little more disappearing, until, if the treatment is persevered in, quite marked opacities can be got rid of and the sight materially improved. If, however, the case be hypersensitive the reaction has to be worked up to each time from weaker dilutions, and this will occasionally reveal a lower reacting point, when, of course, that will then become the one used till it ceases to react. Especial care must be taken in these cases that the reaction shall be brought into complete control before another one is used.

Up to the present only dilutions of P.T.O. have been used for this eye work, and as they have been found entirely efficient there has as yet been no need to use other varieties of tuberculin. The results of the use of other varieties would, no doubt, be interesting. There would not be any hesitation in using O.T. if the necessary reaction could not be obtained otherwise, but undiluted P.T.O. has up to the present been the strongest used except once, when 3, 2, and 1 dilutions of T. were used subsequently. If a case gave a negative P.T.O. and positive T. the latter, I imagine, would be indicated.

Observations on the Tissue Reactions to Tuberculin.

It is not intended in this paper to discuss the views held by the writers on tuberculin effects in tissue reactions as they would be too lengthy, and the investigations now being made are not yet sufficiently complete. Sufficient to say that the treatment was arrived at during the consideration of tuberculous conditions other than eyes, but the deductions arrived at suggested that tuberculin applied directly should be the proper way of treating tuberculosis of the eye itself; but even then the dramatic results that followed the treatment were unexpected, and it was this success which made the separate publication advisable, although really only a small part of a much more extended and far-reaching series of investigations which will require some time to complete. There was naturally some hesitation before applying this method for fear of excessive eye reaction, about which so many warnings have been given in the literature of the subject, of which it is only necessary to quote from one of the best books on tuberculin treatment by Hamman and Wolman. Writing of the conjunctival tests, using 1 per cent. dilution of T., they say (pp. 130–131):—

"The conjunctival test should never be repeated in the same conjunctiva. Such repetitions are dangerous, and the information they afford is of no clinical value. We have repeatedly spoken of the sensitising action of tuberculin. In no position is the local stimulation so well illustrated as in the conjunctiva." ..... "The reactions to the second instillation are often alarmingly severe." ..... "Any existing inflammatory disease of the eye is an absolute contra-indication to the test. A history of previous inflammatory disease, especially of phlyctenular conjunctivitis, is likewise a contra-indication The tests should not be performed in the presence of severe conjunctivitis." ..... "The tests should not be given to manifestly scrofulous children, as they so frequently react violently to tuberculin." (*Note.*—They are generally hypersensitives.) "The presence of conjunctivitis or eczema about the eyelids, so common in these children, is an absolute contra-indication to the test." (These conditions are tuberculous, and should be treated as above indicated.)

In absolute fairness to the authors it must be stated that these observations are quite correct, as they refer to dilution of 1 per cent. of T. for diagnostic test purposes. They also indicate clearly why treatment should be begun with weak dilutions, but they are quoted to show why, holding similar views of the danger of careless eye tuberculin tests, there was considerable hesitation before applying tuberculin locally to the eye, even when work on other phases had suggested that it was the proper treatment.

It equally demonstrates why the treatment should be used with some circumspection by the uninitiated. So that those using tuberculin may not be deterred from affording their patients the relief available, a further quotation from Hamman and Wolman, in their general conclusions as regards the tuberculin conjunctival test, may aid. They say (p. 130):—

"We wish only to state here that our own experience has led us to believe that the serious results which have followed conjunctival tuberculin instillations can with proper precautions be minimised, if not completely avoided, and that the risk run is not great enough to force the abandonment of a procedure which has proved itself of such value in diagnosis."

Other Points in Treatment.

One other matter of suggestive interest may be recalled before dealing with the cases themselves; it is the reaction on the cornea of abrin, the active principle of jequirity

seeds, which has a peculiarly powerful effect in producing inflammation.

It has been shown in the rabbit that an eye could be immunised with gradually increasing doses of abrin applied locally, so that when immunity was reached the inflammatory effect would no longer occur. It was further shown that if a fatal dose of abrin was triturated with the immunised conjunctiva after its removal from the dead animal and injected into a live animal the dose would no longer prove fatal, but if the untreated conjunctiva of the original animal was treated with a fatal dose and injected into another rabbit it in no way interfered with the effect of the dose, which was fatal as usual, demonstrating that the antibody immunising effect was local to the conjunctiva actually immunised. The definite antibodies are apparently retained in the conjunctival tissue. In this connexion it may be stated that evidence points to the tuberculin effect in the eye being somewhat similarly a local condition.

Table showing all Tuberculous Eye Cases Treated.

No.	Disease.	Sex.	Age.	Eye.	Duration of illness.	M.P.C.	Primary treatment.	Doses.	Up to.	Secondary treatment, nebulæ or leucoma.	Doses.	Time elapsed since cure.
							Wks.					Mths.
1	Corneal ulcers	M	8	B	7 yrs.	6	10	16	Orig. P.T.O.	4 mths	19	15
2	,,	M	10	B	3 ,,	6	6	12	1	—	—	12
3	,,	F	15	B	4 ,,	5	14	22	1	4 mths	21	4
4	,,	F	12	B	6 ,,	3	10	18	2	5 ,,	27	9
5	Phlyctenular conjunctivitis	F	11	B	10 ,,	4	8	14	1½	—	—	6
6	Phlyctens.	M	7	B	1½ ,,	4	8	12	1½	—	—	9
7	Corneal ulcers	M	5	L	3 mths	4	6	7	1	—	—	10
8	Photophobia.	F	6	B	3 yrs.	2	8	29	1	8 mths	33	—
9	Corneal ulcers	F	8	B	1½ ,,	3	12	21	1	—	—	9
10	,,	F	9	B	4 ,,	4	8	11	3	—	—	4
11	Phlyctens.	F	10	B	4 ,,	5	11	13	Orig.	3 mths	15	—
12	Keratitis.	F	34	B	7 ,,	6	11	22	3	2 ,,	6	—
13	Corneal ulcers	F	18	B	3 ,,	5	14	29	½	—	—	11
14	Blepharitis.	M	12	B	3 ,,	3	9	10	2	—	—	5
15	Corneal ulcers	F	7	B	1½ ,,	3	10	17	2	10 mths	25	—
16	Phlyctens.	F	8	B	2 ,,	—	6	10	1	—	—	7
17	,,	F	11	B	9 mths	2	6	7	3	—	—	8
18	,,	F	9	B	2 yrs.	1	9	18	1	—	—	14
19	Corneal ulcers	F	12	B	5 ,,	4	7	13	1	2 mths U.T.	8	—
20	,,	F	9	B	4 ,,	6	4	11	3	—	—	—
21	,,	M	7	B	5 ,,	5	20	23	1	2 mths U.T.	6	—
22	,,	F	12	B	4 ,,	6	6	10	5	U.T.	—	—
23	Phlyctens.	M	16	R	2 ,,	6	8	16	1½	—	—	4
24	Corneal ulcers	M	19	B	3 mths	3	6	9	1	—	—	4
25	Conjunctivitis, corneal opacities.	M	10	B	8 ,,	6	14	35	3	U.T.	—	—
26	Phlyctens.	F	8	B	2 yrs.	5	11	18	2	—	—	4
27	Ulcers.	M	40	B	6 ,,	4	14	12	2	—	—	3
28	Corneal ulcers, iritis.	M	33	B	All life.	3	13	28	5	U.T.	—	—
29	Corneal ulcers	M	6	L	4 mths	5	7	10	1	—	—	3
30	Phlyctens, blepharitis.	F	8	B	5 ,,	4	5	11	1	—	—	2
31	Corneal ulcers, blepharitis.	F	4½	B	4 yrs.	3	6	16	3	—	—	1
32	Corneal ulcers	F	8	B	7 mths	4	12	26	2	—	—	2
33	,,	M	2½	L	14 ,,	3	6	10	Orig. P.T.O.	—	—	13

B. = Both. U.T. = Still under treatment.

Complications.—Cases 1, 3, 4, 6, 19, and 23, suppurating glands of neck; 2, bad lupus on face; 5, neck glands, not suppurating; 11, died pneumonia; 12, spine; 15, meningitis, suppurating glands; 25, lupus on side; 32, lupus on nose.

Usually both eyes are treated simultaneously, whether they are inflamed or not, but in a couple of cases one eye was so bad that it was treated by itself lest a flare in the other eye might be produced simultaneously. It was then found on subsequent instillation into the untreated eye no immunity had been produced in it. This is the reason why the practice is adopted of instilling dilutions of tuberculin into both eyes simultaneously whether affected or not, which is now routine procedure.

It must also be remembered in favour of treating both eyes simultaneously that the instilling of the solution into the bad eye alone may cause, when the stronger dilutions are reached, quite a bad flare up in the good one if there happens to be any latent focus to be sensitised.

A subsequent course of subcutaneous tuberculin is usually carried out with a view of consolidating the treatment.

During the whole time of the treatment it has been found advantageous to administer calcium chloride, the formula used being: calc. chloride, ℥ x.; syrup, ℥ iii. Of this 5 to 30 min. is given according to age, stirred up in a cup of milk, after food. In this form direct fresh combination seems to occur with the milk and it is readily absorbed. Cases refractory to the taking of calcium chloride are much more difficult to control, and observations extending over a number of years lead to the conclusion that there is some special interaction in tuberculous cases, which is not unlikely when the general relation of calcium chloride to the tissues is remembered. It is only necessary to refer to the action of calcium chloride preventing the absorption of potassium in ordinary muscle cell metabolism.

NOTES ON

THE DRAINAGE OF AN INFECTED HÆMOTHORAX.

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THE large majority of penetrating wounds of the chest give rise to hæmothorax of greater or less degree. The cases of hæmothorax admitted into base hospitals fall practically into three groups:—

1. Those presenting evidence, clinical or bacteriological, of infection from the onset.

2. Those appearing at first to be sterile which later, often about the tenth to fourteenth day after the wound, show evidence of infection.

3. Those which run a "sterile course" throughout. Some in this class, doubtless, are mildly infected, but clear up without surgical treatment.

The percentage of infected cases differs a good deal in various series of cases which have been published. Bradford and Elliot[1] in 328 cases of hæmothorax found 117 to be infected, Howard[2] in 65 cases had 9 infected, Menzies[3] in 70 had 21. Among 108 cases of hæmothorax I found infection in 31.

The first two classes of case given above usually reach the operating theatre sooner or later for drainage of the pleural cavity. Certain types of infected hæmothorax clear up satisfactorily without continuous drainage—that is, by aspiration alone. A sample of the fluid is obtained by the exploring syringe and sent to the bacteriologist. If he reports, as sometimes happens, a very slight growth in culture of some organism or growth after a long interval only we may assume that the sample contained very few organisms. This may mean either contamination of a sterile sample or a very slight infection. Such cases, so long as they are progressing satisfactorily, may be regarded as sterile and treated by aspiration alone. Picqué[4] claims to have cured 31 out of 48 cases of infected hæmothorax by aspiration, begun as early as possible and repeated as often as necessary. This treatment is the more likely to succeed if the infection is endogenous—i.e., by organisms derived from the respiratory tract, such as the pneumococcus, *B. influenzæ*, and *M. tetragenus*. Endogenous infection is present in rather less than 20 per cent. of infected cases according to Elliot and Henry.[5]

Often the first bacteriological report on a hæmothorax sample is "sterile," but as the patient is not doing well he is explored again some days later, and the fluid is now reported infected. Presumably in such cases we have infecting organisms shut off in blood clot. Under congenial conditions of warmth and food-supply they gradually multiply and in time spread throughout the pool of blood, so leading to the absorption of toxins, increase of the effusion, possibly the production of gas, and the clinical picture of infection. At times the change from the apparently sterile to the obviously infected aspect is quite sudden.

Assuming drainage of the pleural cavity to be proposed for a case, the object of this paper is to bring together a few commonplace points in the method of doing the operation and in carrying out the after-treatment. The dressing and after-care of these cases is not always the simple matter it appears to be at first sight.

Method of Performing Resection of Rib.

Simple thoracotomy, without resection of rib, may be tried when the patient is gravely ill, and the prime indication is

to empty the pleural cavity with the least possible disturbance to him. It is not very satisfactory, however, as the space between two ribs in the type of chest which is likely to receive a gunshot wound is not large enough to give good drainage, and rib resection will usually have to be done later.

If definite infection is diagnosed and operation decided upon it should be done as soon as possible, not only because of the increased risk to the patient involved in delay, but also because the development of adhesions may make the after-treatment more lengthy and troublesome. The usual operation for an infected hæmothorax is that for empyema in civil surgery—resection of a piece of rib, incision of the pleura, and the insertion of a wide drainage-tube. It should fulfil the following conditions:—

1. The hæmothorax cavity should be drained at as low a level as possible.

2. The skin incision and rib resection should be arranged in such a way that the tube when fixed in place has a downward and not an upward direction. The use of a vertical skin incision, instead of the more usual oblique one, makes this easy; it also gives access to several ribs, if for any reason it is desired to resect more than one; and it limits infection of the chest-wall, since the fibres of the latissimus dorsi are separated instead of being cut across.

When there is already a wound in the back of the chest there is a temptation to resect the rib through this, but in my experience this is not a satisfactory procedure. Usually the wound is not in the ideal position for drainage of the chest: if it is too high a pool of infected blood may collect below the level of the tube and poison the patient. Also the tissues of the chest wall beneath a wound will be infected and may break down round the drainage-tube and lead to a nasty, gaping wound, making secondary infection of the interior much more likely to occur. I think the rib resection should be treated as a clean operation and the gunshot wound of the back, if such exists, be treated as an infected wound by excision (if it is seen early enough), removal of pieces of comminuted rib, and packing with gauze soaked in antiseptic. I have notes of several cases in which the chest was drained through a pre-existing wound, and in all of them the drainage was unsatisfactory.

The best plan is to determine with an exploring syringe the lowest interspace from which fluid can be drawn and then resect a piece of the rib immediately below. An adequate piece of rib should be removed, enough to allow the finger to be inserted if necessary during the after-treatment without the risk of scratching it on the ends of the bone. It is a matter of indifference to the patient whether half an inch or two inches of rib be removed, but the former may give him imperfect drainage and the dresser a septic finger or at least a torn rubber glove, while the latter is satisfactory to everybody.

After incising the pleura adhesions between it and the diaphragm are often found and will have to be broken down to reach the hæmothorax cavity. In cases resected some time after the date of wounding these adhesions may be very dense. The hæmothorax cavity opened, it should be explored by the finger to sweep out blood clots and any infected material that may be there and to break down light adhesions. If the missile happens to be loose in the pleural cavity or is in the chest wall, and can be found and removed, so much the better. Therefore it is an advantage to have an X ray examination before operation if possible, but obviously many of these patients are too ill for any unnecessary movement. A case seen recently illustrates the advantage of exploring the cavity with the finger.

Private T., Canadians, penetrating wound of chest Sept. 15th, 1916. Admitted to base hospital on Sept. 19th, 1916. Had a very large left hæmothorax and was very ill with commencement of general jaundice. Was aspirated on Sept. 20th to relieve the dyspnœa, and a rib resected a few hours later. Foul gas and fluid infected with *B. perfringens* evacuated. Not X-rayed. Was five months in hospital in France and England, and returned to duty in France in March, 1917. Early in April had pain in left side and cough. Sent into hospital as "pneumonia." After a day or two a fluctuating swelling appeared under the scar of the old operation and burst spontaneously, discharging pus and sucking in air. X rays showed a partial pyo-pneumothorax and a large piece of shell lying in the costo-diaphragmatic angle not far from the site of the previous incision in pleura. Operation: A further piece of same rib resected, foreign body removed, cavity drained with a wide tube.

Had the cavity been explored at the original operation probably the shell fragment would have been found and the later trouble avoided.

Method of Drainage.

What kind of drainage-tube shall we use? Bilton-Pollard's double-flanged tube is sometimes useful, but in my experience it is not often self-retaining and must be stitched in, and a nurse dressing the case may find it difficult to put back. Moreover, the inner flange may double up and block the lumen of the tube. Wide pieces of ordinary drainage-tubing with thick walls that do not easily collapse are generally best suited. The inner end may usefully be cut obliquely and have a lateral hole. The tube may be fixed in position by one or two stitches to the skin, but as this prevents its being taken out to be cleaned perhaps it is better to tie it in with tapes round the chest. The outer end is snipped to form two flanges, which are bored with a punch, and the tapes are threaded through the holes. This method ensures that the outer end of the tube is kept open.

The tube is covered with dry sterile gauze opened out to its full extent into a spongy pad to make it as absorbent as possible. This is covered with sterile wool and held in position by a many-tail bandage with shoulder-straps. The bandage is applied loosely to allow free play of the chest walls. Enthusiasts, forgetting that the chest is not the abdomen, are apt to apply it as tightly as possible.

In the subsequent dressings the nurse should invariably wear gloves. The most acute sepsis may rapidly spread up the arm from a finger scratched and infected during an operation or dressing on one of these cases. The patient is turned towards the healthy side with as little disturbance as possible. The tube is taken out and cleaned if it is blocked or dirty, then re-inserted, and fresh gauze applied. Cleaning of the skin round the wound, a point which the Carrel-Dakin treatment has brought into prominence, should not be neglected. The skin should be swabbed with ether or soap solution and smeared with sterile vaseline to protect it from the discharges. Another method of limiting secondary infection has been described by Dr. C. Dean.[6] A Carrel tube with numerous small perforations in the middle is looped round the drainage-tube in the form of a horse-shoe, and through it the wound and dressings are irrigated two-hourly with Dakin's solution.

At times irrigation of the cavity is useful in breaking up and dislodging pieces of clot or flaky pus or in sweetening the smell of a discharge infected by putrefactive organisms. There is no risk if there is a free exit for the return flow of the lotion. I have seen one case where irrigation with weak iodine solution led to a papular rash. Normal saline, weak hydrogen peroxide, or boracic lotions are most suitable. Irrigation at regular intervals by Carrel's method is, I believe, being carried out in these chest cases with good results. Several Carrel tubes are passed in different directions into the cavity, and connected up to a reservoir from which they are flushed every two hours with a few ounces of Dakin's solution without disturbing the dressings. There should be room around the tubes for the fluid to flow out freely. This treatment seems to be more suitable in the later stages, and not immediately after resection. I have tried it in but a few cases and found some difficulty in keeping the tubes in position.

If the temperature does not begin to settle down within a few days after the operation the drainage is imperfect. Sometimes the pyrexia may be due to other wounds, to pericarditis, to purulent bronchitis, or to pleurisy or hæmothorax on the other side of the chest; but usually it means that there is infected effusion dammed back on the affected side, either by adhesions, by retained infected clot, by faulty position of the drainage-hole, by blocking of the tube, or by a cellulitis of the chest wall. Search must be made for all these possibilities.

Experience in dealing with these cases, sometimes bitter experience acquired in the post-mortem room, emphasises the fact that a persistently raised evening temperature after a resection of rib means practically always that there is infected fluid shut off in some part of the chest which the tube is not draining.

Transitory rises of temperature, of course, may occur from many slighter causes, but a constant look-out has to be kept for signs of effusion in other parts of the affected side and on the opposite side.

Re-expansion of Collapsed Lung.

At a later stage, when the temperature has settled down and the patient has overcome the dangers of sepsis, the

whole effort of after-treatment must concern itself with the re-expansion of the collapsed lung. Three factors will help in this direction :—

1. Complete healing as soon as possible of the cavity and sinus. Avoidance of secondary infection as far as possible is very important in this connexion. The drainage-tube should be progressively shortened and narrower tubes used, provided the drainage remains satisfactory.

2. A Bier's suction cup may be applied over the hole at each dressing. This not only draws out the discharge, but encourages the lung to re-expand.

3. A simple breathing exercise may be started when the temperature has remained normal for several days. It should be stopped if followed by a rise of temperature The patient lies flat, his body arched towards the healthy side by touching his leg below the knee with his hand; the other arm, that on the affected side, is raised above his head. In this position he draws deep inspirations and blows up his air-ring pillow, at first once, and later an increasing number of times.

I believe that re-expansion of the lung in the early stages can be materially assisted by the use of a valve-tube for drainage. The rubber valve of a soldier's gas helmet fixed with rubber solution to a wide piece of drainage tubing makes a convenient valve-tube. This is fixed in position by suturing round it in turn the pleura, muscle and subcutaneous tissues, and skin, to make an airtight junction. The tube itself must be attached by a stitch or in some other way, lest it be blown out. Such a tube permits air or fluid to be drained out of the chest, but stops the in-drawing of air. The inside of the valve should be moistened with lotion at each dressing. The air-tight joint fails after ten days or so, but by this time it has done its work in preventing the collapse of the lung and cicatrisation of its pleural covering, which are the causes of persistent large cavities, and should prevent the need for severe and extensive thoracoplastic operations later.

Drainage of pleural cavity by long tube stitched into chest-wall to make an air-tight joint. Tapes passing round the chest are tied to the tube as an additional security.

Another method, better than a valve-tube, is the use of a drainage-tube fixed in the chest in a similar manner to the above and long enough to reach under the patient's bed, where its open end is kept constantly immersed under water or weak antiseptic (see figure). This is a very clean and comfortable way for the patient, and saves much trouble and material in dressings during the first 10 to 14 days. The wound heals like a clean incision, the gauze remains dry, the discharge passes down the tube into the bottle, which is emptied at regular intervals and the water changed. The amount of discharge is easily measured. The end of the tube is kept under water or is clamped from the time of the operation onwards, so that no air can be sucked into it. Changes in the intrathoracic pressure during respiration are shown by the oscillations of the level of fluid in the bottle. Assuming the diameters of the bottle and tube to be as 6 : 1, and the amount of oscillation of the level of fluid in the bottle to be ½ inch, we have oscillation of the fluid in the tube to the extent of 9 inches.

Once a day or oftener the tube is clamped at its upper end near the chest, and by pinching it from above downwards to its lower end it is emptied of its contents and collapses; then the tube is released and clean fluid fills it up to the clamp. When the clamp is removed we have a column of water, anything up to 2 feet in height, exerting a negative pressure on the contents of the hæmothorax cavity and the lungs.

Possible objections to this form of drainage occur at once to the mind. (*a*) The tube might become blocked with clot. This is not so likely to occur with the kind of fluid we have in an infected hæmothorax as in that from an ordinary empyema, especially if we use a tube of wide bore. (*b*) Cellulitis of the tissues of the chest wall might occur. Stitching the tissues firmly round the tube should limit the possibility of this. During the operation the surrounding tissues should be packed off with gauze while the incision is made in the pleura, and the tube fixed in place as soon as possible to drain away the infected fluid. (*c*) The long tube might interfere with the nursing of the patient. This is not so in practice, but the gain in comfort from the dressings and bandages not getting soaked in discharge would more than counterbalance it. (*d*) The air-tight joint will fail sooner or later inevitably. This is so, and happens in seven to 14 days after the operation, but this period allows the tube to fulfil its purpose of reducing the size of the cavity and expanding the lung.

The prognosis as regards life in infected hæmothorax is not unfavourable, provided the condition is recognised and appropriately treated. Of my 31 infected cases 4 died (in France). Elliot states that death from sepsis practically never occurs after the end of the second week following the wound. Convalescence, however, is apt to be very tedious, and everything possible should be done in the way of fresh air, cheerful surroundings, tonics, and generous diet to build up the strength and nutrition of the patient.

I wish to thank Lieutenant-Colonel A. H. Waring, R.A.M.C., and Major J. H. P. Graham, R.A.M.C., for the opportunities I have had of seeing and treating practically all the cases of penetrating wounds of the chest which have reached No. 7 General Hospital, and Captain C. M. Roberts, R.A.M.C., for his kindness in taking the photograph illustrating drainage by a long tube.

References.—1. Bradford and Elliot: British Journal of Surgery, October, 1915. 2. Howard: American Journal Medical Sciences, November, 1916. 3. Menzies: British Journal of Surgery, April, 1916. 4. Picqué, quoted by Foisy: "La Pratique de la Chirurgie de Guerre," Paris, 1916. 5. Elliot and Henry: British Medical Journal, 1917, i., 413. 6. THE LANCET, April 28th, 1917.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

CASE OF HEMIPLEGIA FOLLOWING PLEURAL EFFUSION.

BY G. DE B. TURTLE, M.D. DURH., M.R.C.P. LOND.,
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THE following case appears to be of sufficient interest and rarity to warrant recording :—

Patient, aged 23, was admitted into hospital on Feb. 19th, complaining of cough and shortness of breath. On examination he was found to have dullness over the left side of the chest up to the level of the fifth rib with absence of breath sounds and marked ægophony. The heart was displaced to the right side. About 20oz. of serous fluid was aspirated from the pleural cavity and on examination this was found to contain an excess of mononuclear cells, and some red blood corpuscles, but no pus cells. On Feb. 24th, as the dullness had not decreased, the chest was again aspirated, but owing to the needle becoming blocked only about 6 oz. of serum was withdrawn. On Feb. 28th the dullness had increased and had reached to the level of the clavicle, and there was also considerable cardiac displacement. The chest was again aspirated and 60 oz. of serous fluid withdrawn. For some days his condition improved very much, with returning breath sounds over the left lung.

On the morning of March 4th he suddenly sat up in bed, gave a cry, and fell back. On examination he was found to be hemiplegic on the right side with complete motor aphasia. The paralysis of the arm and leg was complete, but the associated movements of the face could be partially performed on the right side. He was not at any time

unconscious and appeared to understand all that was said to him, although when asked to put out his tongue he only opened his mouth. In a few hours there were an increase of the knee-jerk, ankle clonus, and a definite Babinski response in the right leg. Sensation seemed to be very slightly impaired. The bladder and rectum were not affected, and he was able to make his wants known. He remained in much the same condition for about a fortnight when the power of extruding the tongue returned.

A regular course of instruction was commenced, making the patient write from copy with his left hand, and in the course of another fortnight considerable improvement took place; he was able to move the leg but not the arm, whilst the face movements were practically normal. He was able to recognise objects handed to him and to name them, although sometimes he made a mistake, calling a knife a "pencil," &c.; when this happened he was always aware of the fact, and could sometimes correct himself. His pleural condition meanwhile had much improved, there being no re-accumulation of fluid, but a large coarse friction remained for some time all over the left lung. Faradism and massage were employed daily to the affected leg and arm.

The cause of the hemiplegia was undoubtedly embolic, probably a small fragment having become dislodged from a clot in the left pulmonary vein. At the beginning of the illness, on the bare possibility of the condition being an extensive thrombosis due to syphilis, a Wassermann reaction was done, which, however, proved to be negative. The condition is an exceedingly rare one. A number of cases have been recorded from time to time of sudden death occurring during the course of pleurisy, with a large effusion, and it is reasonable to assume that in a proportion of these fatal cases the cause of death has been an embolus from the pulmonary vein or auricular sinus becoming lodged in the internal capsule.

CASES OF POISONING BY SODIUM NITRITE AND BORIC ACID.

BY H. SINIGAR, M.D. LOND., D.P.H.

CASES of poisoning by sodium nitrite and by boric acid are so rare that the following notes of two fatal mis-adventures which have recently come under my notice may be of interest.

1. *Poisoning by sodium nitrite.*—An infant of 16 months was brought to me in a state of extreme collapse by its mother, who gave me this history. Her baby had for several weeks been suffering from eczema. Under a doctor's treatment this had greatly improved and she had brought the baby away for a change. After giving the baby the first dose out of a bottle of medicine which had been prescribed for him she placed him in his cot and left him. A quarter of an hour later she heard the baby cry and on going to him she found him pale and unconscious. She picked him up and brought him straight to me, together with the medicine and the prescription.

The prescription ordered sodium citrate in doses of 3½ grains, with small doses of mag. carb. and sodium sulphocarbolate. Nothing unusual was to be noted on tasting the medicine, and the only other fact elicited which might have had a bearing upon the case was that during the morning of the same day the baby had suffered slightly from diarrhœa. The child was moribund when I saw it, and died an hour after the administration of the medicine.

On enquiry it was found that the prescription had been misread and sodium nitrite had been dispensed instead of sodium citrate. The baby had therefore been given 3½ grains of sodium nitrite.

Post-mortem examination revealed a flaccid empty heart and a marked degree of the status lymphaticus. There were no signs of gastro-intestinal irritation. In this case one can assume that a certain amount of cardio-vascular depression had been produced by the morning attack of diarrhœa, and that the dose of 3½ grains of sodium nitrite acting on the already depressed circulatory system rapidly induced a further lowering of arterial tension with a fatal result.

2. *Poisoning by boric acid.*—I was called at 9.30 A.M. to see a woman of 70 years who, at 4 A.M. on the same day, had taken a teaspoonful of boric acid in mistake for Epsom salts. I found her with a flushed face, but with no other symptoms than the mental distress produced by her mistake. She had already vomited, and I therefore did not consider it necessary to do more than administer a mixture containing carbonate of magnesium and bicarbonate of soda. During the afternoon she vomited several times, and there was some diarrhœa. A fairly comfortable night and day followed. On the next evening great thirst supervened, but she appeared to settle down into a normal sleep. She died in her sleep 46 hours after taking the acid.

On post-mortem examination there was found on the posterior surface of the stomach near the middle of the greater curvature an area about 2 inches square showing numerous circular pock-like erosions of the mucous membrane. The whole thickness of the mucous coat was eroded, the sero-muscular coat being exposed in the floor of each erosion. The right auricle contained a large, firm, ante-mortem clot, the cusps of the mitral valve were thickened, and there was a small granulation on each cusp.

Southall.

MALARIA ACQUIRED IN ENGLAND.

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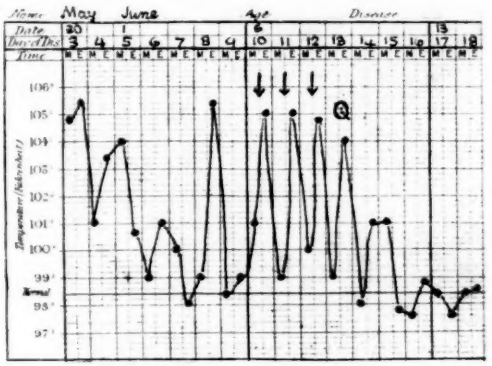
UP to the present this country has been free from disease imported as a result of the war, but it is of the utmost importance to report at once any case of disease so arising in the British Isles.

On May 30th last a man, aged 20 years, was admitted to hospital suffering from prostration and pyrexia of two days' duration. For several days, owing to the fact that the man had never been abroad, the diagnosis was in doubt, but eventually the absence of physical signs, save enlargement of the spleen, noted on the ninth day after admission, and the rigors (indicated in the chart by arrows), led to a correct conclusion, confirmed at once by the demonstration of the



Temperature chart of case of malaria. Q = quinine.

benign tertian parasite in the blood. Recovery was uneventful, the patient being transferred to another hospital on the seventeenth day after admission.

Careful interrogation both of the patient and his parents proved that he spent all his life in the North of England and Scotland before joining the Army, and was well until he reached a particular depôt, to which, as is well known, men who have returned from Salonika with malaria are drafted after discharge from hospital and from which cases of malaria are frequently sent to hospital. From this evidence it is reasonable to deduce that the infection arose at this depôt, the probability of an imported infective mosquito reaching that particular place being very slight.

THE PRESCRIBING OF COCAINE.—At Leeds recently, before the stipendiary magistrate, five summonses against a medical practitioner were heard, and one against another, under the regulations made under the Defence of the Realm Act in respect of the supplying of cocaine under illegal prescriptions. Druggists who had made up the prescriptions were also summoned. It was not suggested by the prosecution that any intentional infringement of the regulations had taken place, the offences having been committed in ignorance, but the summonses had been taken out in order that attention might be called to the law. Nor was it alleged that any undesirable results had followed from the giving of the prescriptions. In the case of the first medical man mentioned the summonses were dealt with under the Probation Act, the defendants being ordered to pay the costs. In the case of the second practitioner the summonses were withdrawn. The prescription on the occasion referred to in this summons had been given to an insured patient, words prohibiting the repetition of the prescription having been omitted. It was pointed out that this instruction was not now necessary, but that the druggist should retain the prescription.

Reviews and Notices of Books.

Malingering, or the Simulation of Disease. By A. BASSETT JONES, M.B. Lond., late Temporary Honorary Lieutenant, R.A.M.C., Welsh Hospital, Netley; late Senior Surgeon, Cardiganshire General Hospital; formerly Medical Referee under the Workmen's Compensation Act; and LLEWELYN J. LLEWELLYN, M.B. Lond., Senior Physician, Royal Mineral Water Hospital, Bath (attached to 2nd Southern General Hospital); Physician, Officers' Convalescent Home, Bath. With a chapter on Malingering in Relation to the Eye, by W. M. BEAUMONT, Acting Ophthalmic Surgeon to the Bath War Hospital. London: William Heinemann. 1917. Pp. 708. Price 25*s.* net.

THE authors in their preface to this substantial volume suggest that the scientific physician has been repelled by the contemplation of the seamy side of human nature involved in the study of malingering, which he has therefore neglected, preferring to establish the features of true disease. Be this as it may, the fact that more than 700 pages of printed matter can be filled with the description of simulated disease and injury, and with elaborated methods for the unmasking of such deceit, coupled with the knowledge that the deception in the majority of cases has for its object personal and, frequently, pecuniary gain, is not complimentary to human nature in the surroundings afforded by modern civilisation. Dedication of the volume to Mr. Lloyd George reminds us also inevitably that modern legislation, in affording protection to the honest and industrious working man from the results of accidental injury and of disease produced by his employment, has offered an opportunity to the less scrupulous of his fellows of which they have availed themselves with alacrity, and with a considerable amount of misdirected ingenuity.

The authors, however, are loth to ascribe to modern laws giving compensation to workmen any considerable responsibility for the practices which have formed the subject of their investigations, and in chapters on the etiology of malingering and on the influence of recent legislation combat the idea with which, they consider, superficial thinkers might otherwise be imbued, that malingering is a special product of the Workmen's Compensation and National Health Insurance Acts. They assign as the "proximate causes"—the phrase is theirs—of malingering frailties inherent in human nature, and proceed to discuss a subject of practical interest to medical men, and to others as well, in treating of the extent to which recent Acts of Parliament may have become determining or exciting causes of pernicious and regrettable practices.

The examination of such questions as the psychology of the malingerer in a volume which deals also with the facts of malingering, with the diseases simulated, with the manner of simulation, and the methods by which it may be detected, involves a rough division of the work under two main headings. The medical man who is called upon to advise laymen as to whether a certain person is or is not affected by an alleged disease or injury, the existence of which that person seeks to establish, will no doubt find himself better equipped for his task if he is able to satisfy himself that the subject of his evidence is a person likely to be predisposed to be a malingerer by physical and perhaps hereditary causes. These, however, are not matters in which those seeking his advice are as a rule interested. The lay tribunal, for example, in a workmen's compensation case has to be convinced as to certain facts before proceeding to apply the law in accordance with those facts, and it would probably not consider it right to take into consideration any suggestion, though it might be correct, that the workman claiming was just the sort of person who might be expected to malinger. Such a condition on his part would be consistent with the presence of genuine disease or injury affecting him to the full extent claimed, and the absence of such a condition would not in any way render his malingering impossible.

From the medical viewpoint the volume deals with one of the most difficult of all problems—the analogies and differences between simulation of disease, psychogenic disease, and early organic disease. In a sense, therefore, it is an encyclopædia of differential diagnosis. Take, for instance, the nervous system, to which, as is natural, much the longest of the medical sections is devoted, comprising no less than 332 pages. In these pages the minutiæ of the examination of the various parts of the nervous system are given, in their bearing on diagnosis, with an accuracy and a completeness not excelled in any text-book of pure neurology with which we are acquainted. Moreover, the authors indicate the relative value of their tests and show this book is no mere compilation of diagnostic tit-bits, but is based on first-hand knowledge and experience of the difficult and important cases of nervous or pseudo-nervous disease with which the practitioner is often called on to deal. They say truly there is only one way to avoid the pitfalls, and that is by "exhaustive and unremitting study of maladies of the nervous system." But these medical sections are much more than guides to differential diagnosis. They contain general observations of much interest on human nature and types of patient, and demonstrate afresh the truth of the old dictum of the eighteenth-century Bath physician who declared it was more important to know what sort of a patient had a disease than what sort of a disease a patient had. In addition to the nervous system the other systems of the body, circulatory, respiratory, alimentary, and urogenital, are all dealt with at length in their bearing on the problem of malingering.

With a subject that covers almost the whole range of medicine and surgery it is not to be expected that all of the authors' statements should be immune from criticism. This is the first book in which we have found due recognition of the value of Sherrington's doctrine of the reciprocal innervation of antagonistic muscles as a means of differential diagnosis, but we take leave to question the authors' application of it. Defective inhibition of antagonists is, according to them, an indication of malingering—"we know that he is attempting to deceive," &c.—whereas nothing is more characteristic of the hysterical limb than this failure to inhibit, as the late Dr. Beevor showed in his Croonian lectures of 1904 and as we have often demonstrated to students. We are of the opinion that the abdominal reflex is of much greater value than Oppenheim's reflex in diagnosing early organic nervous disease (p. 125). "Continued unrest or athetotic movements" are not, in our view, "very marked phenomena" in hypæsthesia of the fingers and hand unless there is also diminution of deep sensibility (p. 155); further, athetotic movements may occur with no demonstrable sensory change. It is stated (p. 386) that spiral fields of vision are met with in neurasthenia and not in hysteria, whereas the converse is usually taught; helicoid curves were first described in hysteria and they are found mainly in cases with cutaneous anæsthesia elsewhere, but that is not a feature of neurasthenia.

We cannot omit a reference to the high qualities of literary and professional scholarship of the book. The cynic who declared that medical literature was a contradiction in terms would retract his statement with this genuine achievement before him, which deserves the widest recognition and appreciation.

The Student's Text-book of Surgery. By H. NORMAN BARNETT, F.R.C.S. Edin., Major and Officer Commanding 3/2nd South-Western Mounted Brigade Field Ambulance; Surgeon, Bath Ear, Nose, and Throat Hospital, &c. London: William Heinemann. Pp. 794. Price 21*s.* net.

THE modern student of surgery is certainly to be congratulated on the number of well-written text-books of his subject from which he may choose, and we welcome this volume, one of the latest in the field, for it possesses some peculiar features of no small merit. One of these is the presence in it of special sections written by specialists. It is true that many of the large works of surgery contain chapters on a number of subjects contributed by surgeons who have devoted special attention to some branch of surgery, but we do not remember ever to have seen them in a student's text-book. We find them here. For instance, we have a section on deformities by Captain R. C. Elmslie, of St. Bartholomew's Hospital; one on arthritis deformans by Dr. L. J. Llewellyn, of the Royal Mineral Water Hospital, Bath; and so on. This is, we think, a very useful arrangement now that the science and practice of surgery has become so vast that it is almost impossible for any one surgeon to be well acquainted with the whole of it. Now as to the special suitability of the book from the student's point of view. The book begins with a very useful account of surgical bacteriology, in which are described most of the

germs productive of surgical diseases, just that amount of information being given that the student is likely to require. So with the chapter on hæmatology and immunity, we find a brief account of the most important facts, and so elsewhere in the book we have, on the whole, what the student is likely to need when he enters the examination room. We have said that the accounts of disease are brief, and the only criticism likely to be levelled at the book is that in some instances the accounts are perhaps a little too brief. Certainly excessive brevity may cause obscurity, and this is sometimes the case in the book before us.

There are numerous illustrations and many of them are very good. A large proportion of them come from the Museum of the Queen's University, Belfast, and are new to surgical literature. To sum up, the student will find in this book a useful guide in his study of surgery.

An Introduction to Dermatology. By NORMAN WALKER, M.D.Edin., F.R.C.P.Edin., Physician for Diseases of the Skin, the Royal Infirmary, Edinburgh; with the assistance of R. CRANSTON LOW, M.B.Edin., F.R.C.P.Edin., Assistant Physician for Diseases of the Skin, the Royal Infirmary, Edinburgh. Sixth edition. With 63 coloured plates and 89 illustrations. London and Edinburgh: William Green and Son, Limited. Pp. 363. Price 15*s.* net.

THERE can be little need to discuss the merits of a book such as this, which has attained, and deservedly attained, to a sixth edition. We can only say that the book is what it claims to be in its title, an introduction to dermatology. Of course, it is not possible to put into a volume of the size of this book all that is known about the diseases of the skin, and for those who need large text-books on dermatology there are many that they may consult; but for the student or practitioner who, knowing little or nothing of the diseases of the skin, wishes to have a book which will assist his practical study, there can hardly be a more convenient work than this. It is true that here and there the views are hardly orthodox, but it is far better that a physician of the eminence of Dr. Norman Walker should speak what he thinks than that he should slavishly repeat received ideas. The illustrations are numerous and good.

Domestic Economy. Part I.: Theory, by MARION GREENWOOD BIDDER. Part II.: The Practice and Teaching of Domestic Economy, by FLORENCE BADDELEY. Two vols. Cambridge University Press. 1916. Pp. 167 and 189. Price 2*s.* 6*d.* each net.

THESE volumes form a text-book for teachers of domestic science and for students in training, the special aim of the authors being to exhibit science and practice in due relation to each other. In this they have succeeded well, as can best be seen by reading the two volumes side by side rather than in succession. The theoretical volume is from the pen of a physiologist, who shows by innumerable small touches her acquaintance with things practical and states her facts in a manner to lead up to their application to domestic life. The chapter on Bacteria and Housewifery is a particularly useful one. The volume devoted to practice is by a teacher of domestic economy and contains much that other text-books omit but which most practical people want to know. Both authors handle their subject freshly, not following their predecessors unquestioningly. The statement found in almost all text-books of this kind that milk is a perfect food is qualified by the reservation that milk is too deficient in carbohydrates to be an ideal food for adults. Taken as a whole, this should be a useful text-book for health visitors, although the application of the principles to mothercraft is not expressly dealt with—an omission which might well be remedied in a future edition.

THE *Paris Médical* for June 2nd has a special interest for radiologists in that practically the whole number is devoted to the use of the X rays in diagnosis and treatment. The opening paper is by Dr. Albert Weil on the Progress of Radiology, and the same writer contributes a most excellent article on Radiotherapy in Tuberculous Disease of the Bones—the improvement in many cases being most striking and well illustrated by radiographs taken before and after treatment. Another valuable contribution is that on the Radiodiagnosis of Strictures of the Large Intestine by Dr. Bensaude and M. Guenaux. There are other articles that will well repay careful study by specialists in radiology.

New Inventions.

AN IMPROVED NEEDLE-THREADER.

IN THE LANCET of June 30th Mr. Victor Bonney describes his method of using Reverdin's needle. For many years this needle has been employed by the surgeons of the Cancer Hospital, and ample opportunities have been afforded me by observation and personal use of determining its good and bad points. The objections to it may briefly be summarised:—

1. The instrument is so little used in this country that its mode of operation is rarely known. Consequently, a facile technique can only be obtained by employing the same or, at any rate, an accustomed assistant in both hospital and private work. Owing to constant change of residents and to the conditions that frequently obtain in private practice, this is often difficult. I have seen other surgeons exasperated, and have been exasperated myself, at the slow, clumsy way the needle has been threaded, even by assistants well acquainted with its mechanism.

2. Threaded in this way, particularly if a continuous suture be employed, the handling to which thread or gut is subjected constitutes a grave defect in technique.

I abandoned the routine use of this needle some three years ago, but was able to overcome both these difficulties by threading the needle myself. Mr. Charles Ryall first introduced a threader which will be found illustrated in catalogues. It possesses, however, ring handles, and can therefore not be put to any other use. At my request Messrs. Allen and Hanburys, Wigmore-street, W., made me the threader here illustrated. It can be used as a dissecting

forceps, and with it the needle can be rapidly and certainly threaded by the operator, thus making him in this regard independent of his assistant. The suture need only be touched to tie the knots, or even these can be tied quite quickly without handling.

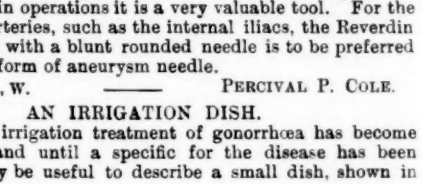
3. Another objection to the needle is that it necessarily makes a large hole and tends to tear structures that are not easily approximated, as, for example, peritoneum in the upper abdomen.

4. And, finally, it has a way of going wrong unless very carefully tended. To the general surgeon its field of usefulness is definitely restricted, but for certain purposes and for certain operations it is a very valuable tool. For the ligature of arteries, such as the internal iliacs, the Reverdin holder armed with a blunt rounded needle is to be preferred to any other form of aneurysm needle.

Harley-street, W. PERCIVAL P. COLE.

AN IRRIGATION DISH.

SINCE the irrigation treatment of gonorrhœa has become recognised, and until a specific for the disease has been found, it may be useful to describe a small dish, shown in the illustration, which greatly facilitates irrigation. I have been using it for the last six years. It consists of a shallow dish with a vent-pipe to which rubber tubing is applied and carried to a receptacle on the floor. The dish is placed between the thighs as the patient is lying on the couch and all the fluid used is carried to the receptacle. This obviates the emptying which has to be done several times during the operation if three or four pints of lotion are used, it is nearly impossible for any of the lotion to be spilled, and it also ensures the irrigation being done whilst the patient is on his back, certainly the position *par excellence* for this little operation.



The dish has been made for me by Mr. J. H. Montague, of 69, New Bond-street, W.

Bedford-square, W.C. DUDLEY KENNARD, F.R.C.S. Edin.

THE LANCET.

LONDON: SATURDAY, AUGUST 4, 1917.

Medical Centralisation and Devolution.

THE recent overwhelming vote of the Representative Meeting of the British Medical Association in favour of the creation of a Ministry of Health confirms the very general agreement which is being reached both within and without the medical profession in regard to the necessity of such a scheme, and stamps the suggestion with the seal of professional organisation. The Council of the British Medical Association calls upon the Government to take over from existing Government Departments all duties concerned with the health of the community and to allocate them to a department dealing with these duties alone. The major proportion of them devolve at the present time on the Local Government Board and the National Health Insurance Commissioners, although most other departments of the Civil Service have important though less comprehensive connexion with medical matters. The alternative rests, therefore, between merging the medical department of the Local Government Board with the Insurance Commission in a separate Ministry, or lodging the work temporarily under the roof of the Local Government Board, distinct from its other purely administrative duties, or under that of the Insurance Commissioners. We have already seen reason for preferring the former alternative, but the consideration of questions which are hardly more than those of housing should not distract attention from the immensely more important question of the devolution of the authority of the Ministry, wherever housed, to an ultimate unit of medical practice. The scheme of the British Medical Association contemplates the division of the country into suitable areas under local administrative authorities, consisting of representatives from eight different classes—viz., the rating authorities, the education authorities, persons contributing to the insurance scheme, the medical profession, the public hospitals, dentists, pharmacists, and nurses—and it suggests the appointment in each centre of two principal medical officers of equal status, one for the preventive side, the other for the clinical side of medicine. We are accustomed to the devolution of preventive medicine by the Local Government Board down to the smallest local authority of the country, but the contemplated appointment of such a chief clinical officer in each administrative area is the first acceptance by the medical profession of devolution in clinical medicine.

But between this limited and perhaps inevitable devolution and the officialisation of the general practitioner, by making him a unit in a State service of specialists, there is a gulf fixed which is at present only bridged by extreme socialist citizens and by that section of our own profession whose contact has never been intimate with actual patients and actual disease, or has ceased to be so. Evidence of the present feeling of the profession in this respect is afforded by the result of a questionnaire sent out by the British Medical Association which is not yet complete, but in which only one out of 123 areas sending replies preferred a salaried State service to the existing conditions of general practice. The codification of the medical profession into a band of specialists in charge of the different regions of the body or the different ages of mankind overlooks a main factor in the influence tending to keep the human being in health from the cradle to the grave. It is not the punctilious removal of his appendix by a surgical expert, nor the daily analysis of the sugar in his urine, nor the administration of tuberculin at orderly intervals in hundredths of a cubic centimetre that will achieve this end. It is rather the intelligent anticipation of the effect of little causes before they become big ones, the survey of the patient's life, by one who can see the whole of it with a sympathetic eye and in true perspective. The expert's view of his own region of practice may be perfectly correct, but, as in other walks of life, the excessive demands of one department may starve other equally essential departments; the interest of the whole may be sacrificed to the pressing claims of a part. Moreover, the modern cult of scoffing at the practitioner's chief asset, his "bedside manner," is quite beside the mark. The manner may be the veneer covering a badly-built and carelessly constructed piece of mechanism, but it may be, and often is, the polish of every day use. We think that the position of independent general practice is still quite secure and not endangered by any serious proposal for a Ministry of Health which does not also include that of a salaried State medical service.

The scheme of the British Medical Association does not involve the officialisation of the general practitioner, but it does propose a large measure of voluntary organisation and coöperation. In each administrative area hospitals, clinics, or treatment centres are to be recognised or, where necessary, established in sufficient number, at which persons entitled to treatment under the scheme may obtain institutional, consultative, or specialist services on the recommendation of their medical attendant. It is in the proper employment of existing agencies that we see the great field for economy of effort. Short of new establishments, much remains to be done in the utilisation of existing material. In our cities and large towns the work of the hospitals would gain enormously by some system of federation, of concerted action to ensure sufficient accommodation for every age and every class of ailment, while strenuously avoiding any kind of overlapping. Such a system of hospital coöperation has already, we believe, proved its value in Liverpool, and in some other centres where it is already, in part at least, in operation. Among the medical men, too, in any area we believe that

voluntary coöperation may, and will, solve many of the difficulties of the present time. A recent pamphlet issued by the Local Government Board emphasises the economy in man-power to be attained by coöperation in business, and a strong movement is on foot in many branches of the community for coöperation between employers and employed, not to achieve the separate interests of either, but in the common interest of the industry itself. This is no new thought in the medical profession, but we believe it capable of almost indefinite extension, and great value would result as a beginning from the closer coöperation between the medical man and the representative of the insured person on Insurance Committees with a view to securing a more efficient service with less expenditure of effort. A helpful example of a local union of medical men for other than protective purposes is afforded by the Tottenham Medical Union, of which the annual report for the third year is before us. A small but possibly fruitful coördination is suggested by Dr. A. A. MACKEITH in the publication of a local medical directory for Southampton which is, he believes, the first venture of its kind. Coördination at the centre and voluntary coöperation at the periphery will, we believe, solve the pressing problems of a civilian medical service without involving the sort of revolution, advocated by some, which might paralyse medical practice for a generation.

The Work of the Central Medical War Committee.

THE annual meeting of Representatives of the British Medical Association had among the business before it the consideration of the work done by the Central Medical War Committee. The activities of that body were under review for the apposite reason that the Association has from the beginning placed its organisation, its premises, and its purse at the service of the Committee. The action of the British Medical Association in supporting in this wholehearted and generous manner the work of the Central Medical War Committee is proof not only to the members of the Association or to medical men as a section of the community, but to the whole country, that the Committee, in inception, in development, and in scope of work alike, has been representative of the coördinated and considered efforts of the medical profession to organise medical affairs for the conduct of the war. Were it not for this representative character of the Central Medical War Committee and of the two other statutory bodies in affiliation with it—viz., the Scottish Medical Service Emergency Committee and the Committee of Reference of the Royal Colleges—the British Medical Association might have demurred at having so huge a pecuniary responsibility more or less left upon it. They have not for a moment hesitated as to what was their duty as representing the medical profession, and at the annual meeting, by a nearly unanimous vote, they decided to continue along the same generous and patriotic path. This means that the Representative Meeting of the British Medical Association has endorsed the action of the executive of the Association, who have devoted in the past a large percentage of their revenue to carrying on the work of the Committee, and whose future expenditure in this direction will not only be prolonged, but will probably be much heavier.

The practical value of the work of the Central Medical War Committee is the proof of the peculiar position held by medical men in these times of war, of which we reminded our readers as recently as last week. The medical profession at the outbreak of war was the only civilian section of the population whose training enabled them at once to take their place in the Army as integral members of a fighting organisation. As doctors they were wanted with the Navy and Army, and as doctors they took to the Navy and Army that training which they had received for civilian purposes; and in both services their record has been extraordinarily good, and their sacrifices correspondingly high, both in life and in material goods. This is allowed by all, even where it is notorious that the fighting forces have not received adequate medical attention. The blame for this has never rested on doctors as doctors, and only in a very few instances on doctors as administrators. This has been widely recognised, we think, by the public, but of late the medical profession has had a great deal of criticism to bear in respect of transactions which have taken place at the Medical Recruiting Boards. The evidence given before the Select Committee of the House of Commons, which is investigating the subject of the examination and re-examination of recruits for the Army, particularly in relation to the Military Service (Review of Exceptions) Act, showed that the decisions of the military medical boards had in some cases been faulty to a point which could not be excused by the ordinary difficulties of diagnosis or by the personal equations of the examiners. Critics of the medical profession, as well as persons inspired by humane motives or political aspirations, have taken care that wherever a sensational example of mistake has occurred it should be made the subject of protest, to the obscuring of the real value of the mass of poorly paid scientific labour which has been admittedly well discharged. Thus a good deal of the criticism of the Medical Recruiting Boards has been misplaced, but as some of it was undoubtedly just, and as a reform of their constitution was obviously needed, we must regard the misrepresentation of doctors as another example of that mystery—the evil deed from which good comes. We hope that under the new order of things, which is now promised, past mistakes will not be repeated, even while we recognise that in such an individual matter as diagnosis a margin of error will have to be allowed for, in whatever circumstances a medical tribunal is erected.

The suggestion made by Lord DERBY before the Select Committee charged with the investigation of the Medical Recruiting Boards that these boards should be placed under the jurisdiction of the Local Government Board had not, we believe, the significance which was attached to it by many people. It arose out of the fact that the Local Tribunals in charge of exemptions own allegiance

to the Local Government Board, and was really an attempt at the collating of authority. We do not see in the suggestion any proof of a sinister intention to make the Medical Recruiting Boards a branch of the sanitary service of the country, nor, as a matter of fact, can we conceive how the work of these boards can be done efficiently unless the unceasing labours of the Central Medical War Committee are made full use of. That body possesses already general and detailed information concerning the personnel of the medical profession in this country, which could be obtained by no other body without strenuous repetition of work already done, while without the use of this information the Medical Recruiting Boards cannot be properly reconstituted. Moreover, where the appointment of existing Medical Recruiting Boards, whose work has so varied in value, has been mainly inspired by a local unit of the Central Medical War Committee, its duties have always been well performed.

Annotations.

"Ne quid nimis."

THEODOR KOCHER.

MODERN surgery has lost a great exponent by the death of Kocher. He was no rapid diagnostician or lightning operator, and the most instructive hours passed by his pupils were those of their common examination of patients. It was, indeed, his careful clinical examination and his logical deduction from what he found which made his work so fruitful of success, and it was by these virtues that he became one of the most successful teachers of surgery that the world has known. After their introduction the X rays formed an essential part of the teaching in his surgical clinic, but even in such injuries as fracture of the neck of the femur and of the lower end of the humerus they revealed little or nothing which his digital examination had missed. To Kocher an exploratory laparotomy was a confession of diagnostic failure. Born in 1841, he became professor of surgery in the University of Berne, his native town, at the early age of 31, and retained this position until his death at the age of 76. This lifelong association with one centre might well have resulted in a loss of initiative and originality, but he displayed exactly these qualities. If he founded no school of surgical teaching, the thousands of students and scores of assistants who passed through his hands have carried his lessons and clinical standards into every part of the world where surgery is taught. His charge of the surgical clinic in Berne began just at the time that Lister introduced the antiseptic treatment of wounds, and Kocher was one of the first to profit by these methods which enabled him to practise with success the resection of joints, and in association with Professor Tavel, the bacteriologist, to perfect an aseptic technique. His methods of reduction of dislocations of the femur and humerus date from these early years, while his radical cure of inguinal hernia by inversion of the sac, later modified to some extent by Bassini, is the basis of the modern technique. It is perhaps in connexion with the surgery of the thyroid gland that he will be best remembered; he was the first to describe the cachexia in man following the complete removal of the gland, his discovery being based upon operations for goitre which in his hands ran into many thousands during his long career. His success in the treatment of exophthalmic goitre by ligature of arteries under local anæsthesia was such that it was widely disbelieved by those who had not visited his clinic in Berne. Kocher was, as will be surmised, no mere surgical craftsman. He was specially interested in the regions where surgery and physiology merge. One of his most original pieces of work, in association with a number of pupils, concerned concussion and intracranial pressure, and a recent investigation on the coagulation of the blood and the arrest of hæmorrhage by means of a preparation of blood platelets bears the name of Kocher-Fonio. He was active up to the last, and it was characteristic of him that, till quite lately, he conducted his own demonstrations in operative surgery to his students. It is recorded of him that he was never weary, and, under whatever stress, he always exacted the same standard of work from himself as from his assistants. He was elected president of the First International Surgical Congress held at Brussels in 1905, and on two occasions collections of surgical papers by old pupils were published in his honour—but honours were held lightly by one who retained his simplicity while occupying his proud position in the surgical world.

WAR BREAD.

TIME is making it increasingly clear that the only common complaints fairly to be attributed to the use of G.R. flour in bread are the verbal ones expressed in the columns of the press and at question time in the House of Commons. It is admitted that pre-existing disturbances of digestion may be accentuated by the higher proportion of bran in the 81 per cent. wheaten flour or by badly milled substitute flours, but the almost universal experience of the person with a normal digestion, well able to adapt its mechanism to the altered raw material, is one of slightly accelerated progress of the food residues through the alimentary canal with a corresponding freedom from the symptoms of noxious absorption and a feeling of well-being, which has been ascribed by some to the increased intake of vitamines. Incidentally we believe that there has been a great decrease in the habitual use of laxatives. Our Paris correspondent, who speaks of the widespread criticism of the French war bread, records at the same time a surprising improvement in the health returns of the city for the last few months. His allotment to the French miller of a share of the responsibility in the defects of the bread is in line with Lord Rhondda's encouraging statement in the House of Lords a week ago that the difficulties with which the miller—and the baker—have had to contend have already been largely met by loyal efforts and will be entirely overcome as experience grows. This being so, it is to be hoped that very restricted use may be made of the concession of the supply of special flour granted by the Ministry of Food, when supported by a doctor's certificate, and when the application is further approved by a special board appointed for the purpose by the Royal Society. Such certificates should evidently only be granted in the special cases where, to borrow cardiac terminology, compensation has broken down and cannot be re-established by simple means

after these have been given a fair trial. The medical man's burden cannot rightly be increased by the signing of flour certificates for the valetudinarian and the crank. We cannot understand the laxity which has allowed more than half the bakers in Stepney, according to the report of Mr. D. L. Thomas, the medical officer of health, to use white flour in baking, and which has led to an influx of customers from other districts to obtain the illegal commodity. G.R. flour is a necessity of the times, its preparation improves day by day, and the sooner we adapt our internal economy to its utilisation the better.

HYPERIDROSIS AND PERIPHERAL IRRITATION.

IN the course of the three years of war those whose work lies with cases of injuries and diseases of the nervous system have frequently had occasion to observe instances of an extreme degree of hyperidrosis, say, of the hands and fingers, associated with a quite small and apparently trifling wound of the hand. These cases are of considerable interest, as it has been noted that the area of abnormal sweating does not correspond strictly to the particular peripheral nerve distribution associated with the site of the wound. In a recent number of the *Revue Neurologique* M. André Thomas, of the Service Neurologique Militarisé of the Salpêtrière, has published a useful communication on the subject to which we desire to draw our readers' attention. Of his two cases, reported in great detail, one only need be referred to.

The patient was a sergeant, aged 29, who was wounded at Souchez on June 21st, 1915, by a bullet which passed through his left hand. It entered on the dorsal aspect at the distal end of the middle metacarpal, and its point of exit on the palmar side was rather more proximal between the middle and ring finger metacarpals, the former being fractured. Some weeks later the perspiration described below began to make its appearance. During the ensuing winter the hand was colder than its fellow and somewhat cyanosed. A year later his condition was as follows: The proximal phalanx of the four fingers was slightly flexed on the metacarpals, while the distal phalanges were extended; voluntary flexion of these fingers was very restricted, but the thumb movements were normal. The hyperidrosis varied in intensity from time to time; as a rule it was extreme over the palmar aspect of the three ulnar fingers and the ulnar side of the first finger; also over the whole palm with the exception of the thenar eminence; occasionally it spread to the thumb and the ulnar side of the thenar area. It was strictly confined to the palmar surface. The nails on that hand were arched and their lunules had disappeared; the hairs on the dorsal aspect of the phalanges were longer than on the right. The surface temperature was sometimes higher, sometimes lower, than that of the other hand. In the area of hyperidrosis there was distinct hyperalgesia to pin-prick, on the palmar aspect only. Along the ulnar side of the middle finger this hyperalgesia was more pronounced than elsewhere, and a pin-prick here gave rise to "pins and needles" over the whole finger. Further, when such a stimulus was repeated in that area it constantly started fresh exacerbations of sweating over the terminal phalanges of the ring and little fingers. These data pointed to irritation of the nerve filaments of the space between the second and third metacarpals and at the subsequent operation a minute neuroma was detected on the nerve trunk common to the filaments supplying the ulnar side of the middle and the radial side of the ring fingers. This was removed and the little nerve trunk sutured. A fortnight later the palmar skin was quite dry; the adjacent surfaces of the middle and ring fingers were anæsthetic, while the original palmar area was still hyperæsthetic, with the exception just noted. But within a few days the hyperidrosis reappeared spontaneously, and pin-pricks over the hyperæsthetic surface produced sweating over the whole palmar aspect—always excluding the adjacent sides of the middle and ring fingers—with astonishing facility. Further, the pain produced by the pin on the hyperalgesic surface was so severe as to lead to apprehension on the part of the patient, and it was frequently observed that the mere approach of the examiner, pin in hand, was sufficient to provoke sweating over the affected part. This could also be readily elicited by passive movement of the fingers, especially the middle.

It is clear from a consideration of these phenomena that the hyperidrosis was not confined to the cutaneous area of the nerve directly irritated—in the above case by a small neuroma—and naturally the idea of its being reflex suggests itself. The evidence shows unmistakably that stimulation of the irritated nerve trunk reflexly awakened sweat-gland activity in adjacent cutaneous areas, but the explanation of the hyperidrosis under definitely psychical stimuli is not so obvious. In this connexion the work of Pawlow comes to mind. Sweating produced by peripheral irritation is an unconditional reflex; with this reflex are subsequently linked a certain number of sensations—the sight of the preparations for testing the reflex, the sight of the movement of the pin towards the sensitive part, the sight of the examiner who is in the habit of testing the reflex—and once the experiment has been repeated an adequate number of times any one of these sensations, with the associated affective state, is sufficient to arouse the reflex, which is now a conditional reflex. A further remarkable observation noted by M. Thomas is the occasional appearance of sweating in the same area on the opposite hand, though always less in degree. His explanation of the reappearance of the sweating in the above case, after operation, is that microscopical examination of the neuroma showed a fibrous cicatrix among the nerve filaments in the most distal part; in all probability, therefore, the piece of nerve removed, about one centimetre in length, was not quite sufficient.

GIPSY MEDICINE.

NEXT to the Gaelic-speaking Iberians of Western Ireland the gipsies are undoubtedly the most interesting tribal remnant in these islands. Their latest, and in many ways most thorough, apologist and historian, Mr. Frank Cuttriss, of the Nevi Wesh, or New Forest, has much to say on gipsy superstitions, medicine, hygiene, and second-sight. Medical data, he tells us in his work "Romany Life," are wanting on the subject of degeneration among gipsies. We do not know, for instance, what are the statistics of cretinism, particularly of goitre, among the Romanies, but he is of opinion that they are not more *crétin* than other people of Anglo-Saxon or so-called Celtic origin. Nor is intermarriage, necessarily common in a close society not exceeding at present 25,000 individuals in Great Britain, answerable for more mischief in the way of interbreeding than elsewhere. True Romanies, as opposed to half-breeds or Chorodies, are self-respecting hygienists. They boil all dubious drinking water, of which in their travels they have to drink much. They avoid damp clothes or sitting on wet ground, and thus escape the rheumatism which afflicts the careless Chorodies, whose departure from tribal tradition involves also racial decay. They rise with the dawn; they sleep with the dusk. Their children are hardened from the first by having to go barefoot in cold weather. Their physique is good. They are abundantly in the open air. They are active, have small hands and feet, due to their Indian origin, and are quick-witted and talkative in contrast to the lumbering peasantry of Saxon descent. All gipsies of the genuine type seem to have some knowledge of vegetable medicines, which they brew from wayside plants. They dose themselves and probably achieve some results, especially as they avoid the strong alkaloids.

but their exhibition of remedies often follows upon a baseless tradition or the popular name given to a plant. They use, for example, a decoction of eye-bright in the New Forest for washing inflamed eyes. The decoction is pungent and irritative, but "eye-bright" is a name pointing indubitably to the eye, and it would be folly, thinks a gipsy, to disregard an indication from the Unseen. This is of the nature of the old signaturist beliefs of mediæval Europe, according to which God signalled to man what different plants should be used for. The signal was usually visual: a conformation of the bark of the cork-tree resembling an ear—at a very wide interval—was held to point to cork as a remedy for ear-ache or ear diseases. But the signal, by parity of reasoning, might be afforded by a name—e.g., eye-bright. "You can't be too careful of the eye, it's such a precious limb," said a half-caste gipsy, advocating eye-bright as a cure for inflammation of the eye. But though the gipsies are not rational in this matter of collyria, there can be no doubt whatever that some of their botanical applications and draughts prove serviceable. In former days they were credited with using their knowledge of herbs for sinister ends, but gipsies are not now poisoners: they do not *drab baulo* (stupefy pigs) in order to buy the carcasses cheap from their owners. Much less do they concoct potions to destroy their enemies.

THE RELATION OF LYMPHATIC TO PULMONARY TUBERCULOSIS.

Dr. F. Harbitz, professor of pathology at the University of Christiania, has lately published his observations on the post-mortem material passing through his hands in the period 1904–15. His earlier work, published in 1905, on the frequency, localisation, and modes of dissemination of tuberculosis, has been supplemented and criticised in the light of his later investigations, and the result is a valuable contribution to some of the most vexed problems of tuberculosis. The analysis of this work, contributed by Dr. K. F. Andvord in *Norsk Magazin for Laegevidenskaben* for July last, shows that among the 2906 necropsies in the years 1904–15 there were 431 deaths from tuberculosis, the relative mortality from which was, therefore, 14·8 per cent. Among children under 15 years the tuberculosis mortality was 19 per cent., among adults only 14 per cent. There were 203 cases of advanced tuberculosis of the lymphatics, including 61 of generalised lymphatic tuberculosis (32 adults, 29 children). Dr. Harbitz has come to the conclusion that, as far as tuberculosis of the lymphatics is concerned, the disease usually spreads from one group of glands to another through the lymphatic system by a continuous process. Spread of infection by more casual and intermittent means is, he believes, comparatively rare; but he suggests that hæmatogenous infection must be reckoned with when the first infection of a lymphatic gland is traced to childhood. According to his figures, it is a discouraging fact that 40 per cent. of all the cases of generalised lymphatic tuberculosis in adults terminated fatally in chronic pulmonary tuberculosis. And in this form of pulmonary tuberculosis the disease seldom originated as a primary infection of the lungs by inhalation, but as a secondary, hæmatogenous infection from the lymphatic glands. Dr. Harbitz's investigations also afford a fairly reliable pathological, anatomical basis for the hypothesis that the pulmonary tuberculosis of adults is often a late sequel to infection in childhood. In 39 out of 219 cases of pulmonary tuberculosis (18 per cent.) in adults, he says, it was possible to demonstrate the presence of tuberculosis from earlier years, in most cases certainly from childhood. These old tuberculous lesions may have been, indeed possibly were, the source of the subsequent pulmonary tuberculosis. In other words, if his conclusions are correct, the pulmonary tuberculosis was an autogenous or endogenous re-infection. Tillisch, of Grefsen, has found among his patients suffering from pulmonary tuberculosis a history of exposure to infection in infancy in 18·5 per cent. That he should have arrived at practically the same figure as Dr. Harbitz is all the more striking as their methods were totally different, and both were bound to understate the case for infection in childhood. The tuberculin test, it may be noted, shows a far higher ratio of infection in childhood than 18 per cent.

OFFICIAL ADVICE ON FOOD PRODUCTION AND CONSERVATION.

THE public as well as agriculturists throughout the country would do well to consult the valuable series of leaflets issued from time to time by the Board of Agriculture and Fisheries. Copies may be obtained free of all charge on application on an unstamped card to the secretary's offices at 3, St. James's-square, London, S.W. 1. These leaflets are based on practical experience and give exactly the information needed by those who are carrying out schemes in many directions for the economic production and conservation of food. Amongst recent issues, for example, is a practical guide to pig-keeping in towns and villages, in which it is pointed out that people who possess a fair-sized garden or allotment can usually arrange to keep at least one pig. The conditions essential to success are laid down, and particulars as to the choice, housing, bedding, and rationing of the pig are given in clear and simple terms. In another pamphlet a strong appeal is made for the profitable utilisation of surplus milk. The attention of farmers and cowkeepers is called to the national importance of maintaining and economically utilising the milk-supplies. While it is true that milk is most economically employed when employed as whole milk, yet in many cases it is not possible to dispose of all of it for direct consumption. In such circumstances the Board point out the alternative methods for disposal which, with a little intelligence, can be adopted. Amongst these alternatives the producer may decide to condense or dry the milk, or to make butter and cheese and use the whey for feeding purposes. Cheese-making is undoubtedly a sound procedure and has many advantages over butter-making. Cheese-making, for instance, gives direct to the human consumer a greater proportion and a greater variety of the food materials contained in milk than does butter-making, besides which it is more remunerative, particularly in view of the rapidly increasing competition of margarine with butter. Then the whey can be used for calf-rearing or pig-feeding, supplemented by fish-meal, nut-meal, and so forth. In another pamphlet hints of a most valuable kind are given to the great army of allotment holders up and down the land. Probably nine out of ten of these holders are absolute amateurs who hitherto have known little or nothing about tending crops or protecting them against disease, and there is a risk in such cases of losing time, labour, and material simply for the want of practical guidance.

We commend particularly the instructions as to the proper way of storing potatoes in order that the stocks may be preserved over the coming winter period. The way the general public has realised the importance of raising food is admirable, for allotments are very general throughout the country, and a material supply of food is forthcoming as a result. The people have found that not only is this work productive, but educational and interesting. Practical instructions as to how these supplies of food are best stored and kept for future use are much needed, and the clear directions given in these leaflets, issued gratis by the Board of Agriculture, should be kept at hand and carefully followed. An important gain to the food-supply of the community will thus be secured.

"PUNCTURE HEADACHE."

PROVIDED that certain precautions are taken, headache is uncommon as a sequel to lumbar puncture. These precautions are: that not more than 5 c.c. of fluid are removed, a quantity ample for a whole series of investigations—chemical, cytological, and bacterial; and that the patient should be recumbent during the operation and for an hour afterwards. In these days when lumbar puncture may be performed in the consulting-room and—as certain text-book illustrations suggest—in the sitting posture, it seems to be frequently followed by severe headache, and in the *Journal of the American Medical Association* Professor C. L. Dana publishes a careful study of what in America is colloquially termed "puncture headache." This headache, he finds, rarely begins until the day following the puncture, when the patient usually is allowed to get up. But it may begin directly after operation or come on three days later, depending on the activities of the patient and the condition of the cerebro-spinal fluid circulation. There is diffuse bilateral pain, rather severe over the brows, and perhaps somewhat less severe at the back of the head. The pain may be accompanied with nausea and even violent vomiting, and also with giddiness, mental confusion, and faintness. The symptoms are increased by exercise and usually are promptly relieved by lying down. The condition lasts with remissions for from 5 or 6 days to 3 weeks. It is more common in patients whose cerebro-spinal fluid is normal and exudes under low pressure. In other words, the healthy cord reacts badly to puncture. The headache is more severe and more common in young adults, women, and persons of highly strung, nervous temperament. In acute conditions, such as poliomyelitis and meningitis, in which there is high pressure, puncture, on the other hand, often relieves headache. Puncture headache, according to Professor Dana, is due to acute disturbance of the mechanics of the cerebro-spinal fluid circulation. The normal amount of cerebro-spinal fluid is probably not more than 6 drachms, but in brain atrophies there may be as much as 2 ounces. Ordinarily it is secreted slowly, though in fractures of the base as much as a pint has drained away daily. Professor Dana suggests that the puncture and removal of fluid takes away the water-pad of the brain, so that it rests unprotected on the bone, causing irritation of the fibres of the fifth and occipital nerves. The instant relief given by the horizontal posture supports this view. On the other hand, the choroid gland can secrete in 24 hours much more than is removed by puncture. Therefore the puncture must either inhibit the activity of the gland or cause some block in the normal flow. The headache, Professor Dana admits, can usually be prevented by keeping the patient flat for three or more days, a procedure which other observers would consider excessively cautious. After the headache occurs the effective measure is to return him to bed. It is noteworthy that the location of the pain is much like that in neurasthenic and certain toxic and autotoxic headaches. In these also the patient is more comfortable when he lies down. Professor Dana therefore suggests that a good many headaches may be due to defective action of the choroid gland and an imperfect cerebro-spinal circulation. For the normal slow and steady flow from the lateral ventricles into the third and fourth ventricles through the foramen of Magendie, and thence into the villi of the dura mater and venous sinuses and veins might be disturbed in various ways.

INCREASED PRICE OF DRUGS IN SOUTH AFRICA.

THE greatly increased cost of drugs in South Africa, consequent on the war, is becoming a matter of moment to the various hospitals there, and to the military authorities. The matter is now of such urgency that representation to the Imperial Government is suggested as the only means of obtaining the necessary supplies. An exceedingly large quantity of quinine has been used to combat malarial fever in the campaign in German East Africa and the price of quinine has advanced enormously; most of it has been supplied from England, and its export from England has now been prohibited. Great difficulty is experienced in South Africa in obtaining requisite supplies of such an essential as carbolic acid. The cost of drugs at Pretoria Hospital, where there is a large amount of military work, has advanced from £2000 to £5000 a year; and at the Johannesburg General Hospital the increase is £3000 a year.

THE ORAL ADMINISTRATION OF ANTITOXIC SERUM.

ANTITOXIC serum has in time past been administered by a large number of different routes which are in essence only two: indirectly by the alimentary canal, or directly into the body whether *via* blood-vessels or lymph-spaces. Dr. William Fearnley, of Ackworth, sends us an interesting note on the administration of diphtheria antitoxin by the mouth at the Pontefract Isolation Hospital, where this method has been in practice for many years. From the year 1909 to the present time 120 cases have been so treated, with 118 recoveries and 2 deaths, one of which occurred within a few hours of admission. No tracheotomy was performed during the same period. The figures he gives are striking in view of the fact that the death-rate of serum-treated cases of diphtheria in hospitals is now from 3 to 14 per cent., according to the virulence of the disease and the early administration of the serum, whereas it was 30 per cent. or more in pre-serum days. A mortality of less than 2 per cent. may, in fact, be determined rather by the type of infection than by the influence of treatment. As long ago as 1902 Professor R. T. Hewlett produced evidence before the Pathological Society of London showing that in experimental animals antitoxin was not absorbed

by the mucous membrane of stomach or rectum, and in 1904 Dr. E. W. Goodall stated that experimental evidence was entirely against the efficacy of oral and rectal administration of antitoxic serum, and that no valid clinical proof had been adduced in its favour. Rectal administration was introduced at the London Temperance Hospital and given an extended trial there by Dr. J. H. Rhodes, but was discontinued. Recent text-book opinion is all against serum administration other than through the skin. Dr. J. H. McCollom and Dr. E. H. Place state that the oral administration of diphtheria antitoxin is too slow and its effects too uncertain for practical use, most, if not all, of the antitoxin being destroyed unless digestion is interfered with. Dr. F. F. Caiger and Dr. H. E. Cuff simply give their opinion that the alimentary method hardly calls for serious consideration. The former indeed goes so far as to maintain that any practitioner who relies upon the administration of antitoxin either by the mouth or rectum in the treatment of a really severe attack of diphtheria takes upon himself a very grave responsibility. Dr. W. H. Park suggests that any good accomplished must be due to the local contact of the serum with the diseased tissues. Against this weight of evidence we think that the oral administrator of serum is incurring some risk of adverse criticism when he comes to deal with severe cases of diphtheria.

PHARMACOPŒIA PREPARATIONS CONTAINING SUGAR OR GLYCERINE.

THE General Medical Council have announced (*London Gazette*, July 27th) that until further notice a number of preparations containing glycerine or sugar are excluded from the British Pharmacopœia. It may therefore be assumed that pharmacists will commit no offence if in dispensing these compounds they leave out the sugar or glycerine; but since many chemists will no doubt continue to use the official preparations, while many will use a modified formula, it would be advisable—for the sake of uniformity of action—for prescribers to state on their prescriptions that they mean the preparations to be glycerineless or sugarless—e.g., Tr. Card. Co. sine glycerin. It would be better still if a set of formulæ could be drawn up, say by the Pharmaceutical Society—or preferably by the General Medical Council—which could be regarded as temporary standards. Failing this the taste and appearance of medicines dispensed from the same prescription are likely to differ considerably. Immediate action on the part of the General Medical Council or the Pharmaceutical Society is desirable.

NEWHILLS CONVALESCENT HOME. — Sir Alex. McRobert, of Cawnpore, has intimated his desire to present to the Newhills Convalescent Home, Aberdeenshire, the generous sum of £6,000 as an endowment to the institution on certain conditions being fulfilled, viz.:—(1) That the said endowment should be administered by a duly incorporated body, and (2) that the free income should be applied solely for the treatment of convalescent patients connected with the city of Aberdeen and the parish of Newhills, and that no part of such free income should be applied in connexion with the treatment of tuberculosis. At a special meeting of the subscribers held on July 24th the gift was received with the most profound gratitude, and the board of management intimated that everything possible would be done to satisfy the wishes of the generous donor. The desire was expressed that the connexion of Mrs. Smith, who has done so much for the institution, should be commemorated by some suitable tablet or in some other way, and the chairman promised that this matter would be taken into consideration.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

The Recent Reduction of Mortality in Paris.

EXAMINATION of the weekly statistics published by the City of Paris shows a remarkable diminution in the mortality figures usual for the summer months. The number of deaths based on the weekly average of the last five years was 915 for the month of May, whereas the four May weeks of the present year have furnished successive figures of 856, 873, 869, and 505. In June, with a mean of 815, the corresponding figures have been 653, 614, 862, 692. In July (748) the figures so far available are 748 and 623. The reduction is striking enough, and it should be added that the population of Paris, reduced by the departure on mobilisation of half a million soldiers, as well as of enemy aliens and many neutrals, has now returned to its previous figure owing to the influx of refugees from invaded provinces and from Belgium, and to the arrival of munition workers from the provinces and numerous foreigners. The causes of the improvement in the sanitary condition are not easy to assign. The most important is probably the effect of daylight-saving, which insures the population spending a longer time in the sunshine, which is so destructive of morbid germs. Epidemics have, in fact, been much less numerous and more benign than in preceding years. Measles, which has raged since May, has been replaced by a much milder type of disease. Other factors of which account should be taken are: the closing many days a week of a number of places of amusement in which accumulate the germs of influenza and respiratory disease in general; a considerable limitation in the means of transport, which has forced many people to go on foot and to lead a more hygienic existence; and, finally, the reduced consumption of meat, which has been of benefit in so many maladies of nutrition.

Rat-bite Fever in France.

M. Perdu gave the Society of Comparative Anatomy the results of an investigation suggested to him by an observation made by M. Briallon and himself in 1911 on the local and systemic results of a rat-bite in a child. He is convinced that the bite of a rat may sometimes give rise to a definite morbid state. In November, 1912, the same authors observed a second case in an adult, shortly before learning that this rat-fever was known in Japan to some observers under the name of "sodoku," which is sometimes used as a synonym for syphilis. Five other cases have recently been observed, and the existence of sodoku in France, as distinct from syphilis, seems now to be well established by the wide distribution of the places where it has been observed and the early observation by Millot-Carpentier. Japanese authors describe various forms of the condition—viz., local, febrile, painful, nervous, and even abortive. The condition may readily be missed unless its possibility is present to the medical man's mind. To gain any proper knowledge of the virus inoculated would involve the production of the infecting rat, which in practice is a matter of difficulty. In laboratories, however, when a member of the staff is bitten by a rat the latter should be isolated and observed.

War Bread.

From all sides criticisms have been made of the war bread. Apart from its dark colour and disagreeable odour, mastication is laborious, and when insufficiently carried out results in gastric trouble both in adults and children. Owing to the lack of wheat bread is made with flour ground to more than 85 per cent., with the addition of 20 per cent. of other cereals such as barley, rye, maize, rice, or beans. The bread is, in addition, badly prepared, inasmuch as the millers, presuming on their permission, grind the flour to 90 and even 95 per cent. and leave in it much dust, mildewed and foreign grains, ergot and dodder seeds. War bread contains much bran, which the human digestive canal cannot utilise, while depriving of it the beasts which can. Economy in one direction is lost in another. Protests have been raised, and the journals have published the unfavourable opinions of many well-known medical men. The public would prefer a diminution in the quantity of bread allotted provided that the quality could be improved. The Ministry concerned has announced a return to 80 per cent. flour and the issue of bread cards.

Correspondence.

"Audi alteram partem."

THE LUMLEIAN LECTURES AND MEDICAL RESEARCH:

"INNOCENT MURMURS."

To the Editor of THE LANCET.

SIR,—In his letter to THE LANCET of July 14th Sir James Mackenzie has set forth again his criticism of the "old school," and a little more definitely. By the "old school" I presume him to signify those physicians who reason from clinical rather than from experimental data. The controversy on both sides has been rather discursive, as controversies are wont to be. Sir James Mackenzie casts up against the "old school"—I take his name for us—that our knowledge, if such it can be called, is "guesswork and not accurate." This is a true, and long will be a true, imputation against clinical medicine in all its departments; it is true that substantial progress in medicine can be made only by reducing our empirical to quantitative terms—a slow, laborious and intricate task. In the study of heart diseases we are grateful for the excellent work of this kind by Sir James Mackenzie himself, and by others, such as the electrocardiographers and X ray experts. The old school is only too well aware of its shortcomings, and is humbly doing its best to hear and to learn what the new school has to teach by graphic and experimental methods. Still, if the old school has made too much of imperfectly analysed experience, the new school is not without its faults. It is rather blind to the mass of clinical material—raw material, if you please—gathered together from the days of Senac and of Laennec to those of Balfour, Broadbent, and clinical teachers happily still with us; while, on the other hand, it is tempted to rely too enthusiastically upon artificial experiment, as on the play of organs, such as the heart, isolated from their systems. In his own polygraphic work it is true that Sir James Mackenzie applied his quantitative methods to parts working in their own systems; but at times, it seems to me, he also has relied too much on superficial laboratory experiments. We follow him best, if I may venture to say so, when he is not straying far from the lines of his original researches, lines which his many interests tempt him at times to forsake. Moreover, the new school is too scornful of provisional notions—*axiomata media*—which in the inexact sciences are common and generally necessary steps to scientific truth.

But to return to the letter, the purport of which professes to be to discover the mechanism of morbid signs, and therewith to forecast the future of the individual patient. To this end Sir James Mackenzie discusses (*a*) lesion of a valve only; (*b*) lesion or default of the myocardium; (*c*) the two together. In (*a*) the author desires to ascertain the causes of systolic murmurs (by the way, are they not of the same mechanical kind as the diastolic?); but in this search we cannot afford altogether to disdain "curable (or let us say "transient") mitral regurgitation, bruits of debility, and exocardial bruits"; for similar physical laws underlie them all. However, exocardial murmurs may for the present be dismissed, and likewise the murmurs of anæmia, with such others as may be due to fall of viscosity, vibrations of atonic vascular coats, or changes in cross section of the aorta or pulmonary artery of a transient kind. Furthermore, we may conveniently omit variations of velocity in sections of the stream, of viscosity, and of angles of curvature which, in the designs of the blood-vessels, are compensated. Thus unburdened we may pass on to endocardial murmurs, whether simply valvular or due to changes in cross-section of chamber or large blood-vessel, as in acute infections. Now these, whether permanent or transitory, can be due only to fluid veins, to eddies in the stream. In our familiarity with them we forget to wonder at the perfect silence in the normal heart of the rush of the blood at high velocities from tube to chamber, from chamber to chamber, and from chamber again to tube; a sweet running due to the perfect adaptation of cross-sections of chambers and orifices, blood viscosity, valvular apparatus, and so on. If we appreciate this rhythm, and realise the long evolution in which by progressive adaptation and selection it must have come about, we shall realise conversely the infinite importance in physiology of the elimination of every disturbance of stream lines, and the "horror" nature must have of any turbulence in the flow. A naval engineer is so keenly alive to the need of sweet running and to the peril of unequal stresses, that even in his sleep, he will hear a murmur in his machinery and rouse himself instantly to set things right. Now we old school men are not sure that Sir James Mackenzie lays due emphasis upon this side of the problem; fully alive as we all are, and have been, to failure of virtual head—i.e., to failing myocardium, which it is true may be, and usually is, still more important. But we have to watch both sides of the equation.

Let me then, with him, reflect upon the mode of generation of a "murmur," which when perceptible to touch we call also a thrill, and which must be a slip, more or less, from sweet running; somewhere friction has arisen; and, however remediable, cannot be a matter of indifference. For the most part it is an internal friction; it is generated in the blood stream rather than by rubbing of the blood against the wall of the vessel.[1] We know that the highest velocity in any section is in the axial current, and here it is that friction (eddy, murmur) becomes most audible, and not infrequently palpable; the collisions of particles being propagated to the vascular walls, and other continents, thence to the walls of the thorax, and so to the ear. The point to be stressed is the abnormal increase of friction which, even if transitory, cannot be negligible.

How then may such eddies, such change of linear into turbulent stream motion, be produced? The possible contingent causes we may be content, I think, to reduce to one class—namely, to changes of cross section—to diverging or contracting boundaries. I have said that in a stream secluded from the air mere roughness of walls is probably a very subordinate cause of murmur, unless a spit project so far into the stream as to set up an eddy within it; and even then we have but a mode of altered cross-section. A roughened aorta may perhaps generate a systolic murmur, but in such cases the cross-section of the vessel is usually larger.

To illustrate the murmuring of a blood stream and its dependence on cross-section, we all know that the outflow of a stream from a cistern by a cylindrical channel—let us take the familiar instance of the common water-tap—is not cylindrical but conical and noisy, and the outflow therefore but 60 or 70 per cent. of the available supply. But if the mouth of the tap be made to a certain degree conical, practically a full outflow may be obtained, and the murmur at the orifice will cease. The same reasoning applies likewise to a simple aperture, such as any one of the orifices of the heart. In the normal heart the cross-sections of these orifices and of the corresponding chambers are mutually shaped on this principle of least friction, so that any alteration of cross-section in orifice, chamber, or tube may set up fluid veins in the stream; that is to say, an abnormal friction, which may become audible and even palpable. But, if so, kinetic energy must be running to waste, a waste which we dare not fail to appreciate, however well satisfied we may be with the virtual head—i.e., with the myocardium. A young myocardium is capable of miracles, but it is not safe to argue that, so long as the heart is doing its work, even in response to an extraordinary call or test, this waste of energy may be neglected, and the murmur pardoned for its "innocence." Internal stresses have a habit of slow multiplication. The effect of a continuous exertion of a very small increment of friction must in the course of time be very great. It seems to me that a systolic apex murmur must mean, while it lasts, turbulence of the stream lines at mitral or tricuspid orifice, and presumably a vein of regurgitation. To such appreciations we should like to see Sir James Mackenzie devote more of his method and ability.

It is true that a heart is in a measure the result of its own functions; it is true that in health and youth it contains a rich potential wherewith to meet sudden demands; it is true, moreover, that a permanent increase of demand is met by a buttressing of structure, and that in this new building may be contained also some more potential, if not proportionately more; still the new arrangement can never be as good as the normal, or it would have been the normal.

[1] Whether or no the blood wets the wall of its vessels is as yet undetermined (see Allbutt, Diseases of Arteries, vol. i., p. 37). Probably there is a motionless layer upon the vascular wall, changed only by molecular forces.

However good its nervo-muscular nutrition and its balance, the organ is at a disadvantage. And however long and well the myocardium may respond to an "effort test," this remains true. Kinetic energy n lost at each beat = 3600 n per hour; and so on per day and per year; a formidable total, even if we suppose the structural conditions to be static. But they are never static. Sir James Mackenzie says a man with aortic regurgitation may reach his "normal span." Were Sir James Mackenzie a writer of less authority I would boldly answer "Never." For many years I held hospital appointments in the midst of a labouring population; in Cambridge I have watched cases of valvular heart disease in a more sheltered community, and the case of longest duration of life from the establishment of an aortic regurgitation which I have witnessed was 23 years. The patient was not syphilitic; the lesion was attributed to rowing in his college boat. The heart was a little enlarged to the left, but by less than a centimetre, and kept remarkably stable all through. Death was, as usual, quite sudden at (about) the age of 55. However, this is only on a by-point of the letter. Sir James Mackenzie's main argument is that a murmur—a mere murmur—without alteration of the heart's dimensions sufficiently conspicuous to be ascertained by the usual methods (it is idle to require the use of electric, radiographic, and like methods in ordinary practice), and without auricular fibrillation or *a.-v.* delay, is negligible; is "innocent," unless effort tests give evidence of a failing myocardium; and that the state of the myocardium can be discovered by responses to "effort tests." If the response be adverse then the case is a serious one; if not, well, the murmur is but one of the bogeys of the old school.

In the next place then we have to endeavour to ascertain what Sir James Mackenzie means by "effort tests." In my work on "Diseases of the Arteries" (Vol. II., Chapter on "Myocardial Values") I have discussed these tests and, whether from physiological or psychological reasons, found them all wanting. I must not now occupy these columns with a reconsideration of them. The only effort tests which in my opinion can pretend to an approximate certainty are those carried out by Dr. Lewis and his staff at the Hampstead Military Hospital. But these consist in regulated exercises continued for days, and even for weeks; tests carried out under military discipline by an expert staff and continually revised during many months of experience. By these, in two or three weeks, we do arrive at some decision concerning the soundness of a soldier invalided with heart symptoms. On the other hand, during a single visit to a consultant, to run up a pair of stairs, to turn a handle, or to perform an extempore gymnastic are, as tests, if not futile, at any rate crude and fallible; until in the later stages of heart disease, when we are independent of them. We are upbraided for "guesswork" and default of "accurate knowledge," but does this vagueness lie wholly at our door? Will the new school begin a reform on "effort tests"? For instance, so far as dyspnœa is an indication of unsoundness we have found that in the so-called "soldier's heart" well-marked and constant dyspnœa on effort is consistent with a sound heart. In few cases can psychological incidents be wholly eliminated. Sir James Mackenzie cites as examples cases of rheumatic or other myocarditis falling upon the intercameral fibres, with the consequent delay so beautifully exhibited in his own polygraphic tracings; tests which so far are convincing enough, but apply to those comparatively few cases only in which a small focus happens to occupy a critical point. Otherwise the scars of them may be, and usually are, of no ultimate importance.[2] Besides, this is not an "effort test."

Again, myocardial values—and so, theoretically, response to effort test—fall off in all persons from middle life onwards; say after the age of 45. Sound as under pathological inspection the myocardium may prove to appear, it had grown gradually poorer in vital endowment and reserve.[3] But to suppose that by any graduation or refinement of tests we can plot out and allow for this periodic myocardial declension is at present out of the question. Let us take, for instance, so very common a case as this: in a man of this maturity a mitral systolic murmur is by some chance discovered. Probably a slow sclerotic process is invading the valve. No test, clinical or physiological, can give us the touchstone of the myocardial value until in the course of years the defect and its consequences are so far advanced that effort tests are no longer wanted. But are we to regard this murmur, even so long as it is a solitary symptom, as insignificant?

Another direction in which unhappily we have incurred Sir James Mackenzie's grave displeasure is in our neglect to complete our nosological series; especially in respect of the earlier periods of disease. When, for example, I reflect upon what has been done to link up tonsillar lesions with rheumatic fever; to trace the effects of septic states of the mouth; to disentangle the respective tracks of bovine and human tubercle; the clinical courses of gastric and duodenal ulcer or of gall-stone; the different forms of meningitis; the several varieties of typhoid fever, and of dysentery—nay, I must stop or I shall fill the page—all of them researches in which the "old school" has not been wanting, I think our confessed shortcomings in respect of the initiations of disease deserve a more generous interpretation. Sir James Mackenzie's own illustration that "no one had really studied ..... the effects of pregnancy on the circulation of the healthy woman," is amazing. The number of papers on this subject from the points of view of fœtal toxins, of phases of blood pressure, of minute anatomical comparisons (post mortem), on Müller's or other accurate method, of the several chambers of the heart, of positions of the diaphragm, of statistics of pregnancy in heart disease, and so forth, are, however contemptible, at any rate innumerable. Now from this very point of view I will venture to cast a small pebble even at our judge. Does not the clinical observer, be he of the old school or the new, who neglects or even sets at naught the early intimation of some turbulence in the current of the heart's blood, as revealed to the ear by a murmur, seem himself to fail in attention to those initiations, those early terms of disease? For I repeat that when, after some years perhaps, the accumulated effects of abnormal friction in the heart have advanced so far as to betray themselves to "effort tests" the malady is no longer incipient, it has entered upon its final stage. Effort tests, now for the first time responding, are almost, or quite, too late. On the other hand, I have recently examined two men with very slight but certain mitral stenosis in whom effort tests are negative, and who have hitherto led lives of unrestricted activity without any sense of incapacity. The "new school" physician who accepts for life insurance a man with a mitral systolic murmur because his responses to "effort tests" are, as well they may be, negative,[4] will in too many instances prove in later years to have been an unhappy adviser. "The first stage in *heart failure* (italics mine)," says Sir James Mackenzie, "is invariably shown by a limitation of the heart's response to effort" ..... "breathlessness, sense of exhaustion, pain, abnormal action of the heart," and so forth. But such a patient is already upon the descent to the grave. Much is made, and rightly made, by the "new school" of the discovery of fibrillation of the auricle, the only direct betrayal of a myocardial degeneration, and this of one mode only; but it is a phenomenon not of beginnings but of dissolution. Of the early phases of slow frictional strain, waste of potential, and long consequent declension of the myocardium we still remain without measure until the stealthy footstep of Azrael is upon us.

I am, Sir, yours faithfully,

Cambridge, July 26th, 1917. CLIFFORD ALLBUTT.

[2] See Allbutt, Diseases of Arteries, ii., pp. 51–2, and the researches of Poynton and Paine and Carey Coombs.

[3] Allbutt, loc. cit., ii., 475.

[4] "If a systolic murmur was present and there was no sign of any myocardial involvement, then the murmur was of no significance." J. Mackenzie in THE LANCET, July 14th, 1917, p. 61, col. 2. "I would put a mere innocent murmur into Class A if other symptoms were all right. A man who complained of shortness of breath, palpitation, &c., would be dealt with differently" (by the undertaker?), J. M. in *Times*, July 24th, 1917, p. 3, col. a.

THE QUEEN'S HOSPITAL: APPEAL FOR EQUIPMENT.

To the Editor of THE LANCET.

SIR,—May we earnestly appeal to the generosity of the public for donations in support of this new hospital and training school, established (with the gracious approval of Her Majesty the Queen and with the consent of the Directors-General of the Navy and Army Medical Services) at Frognal, Sidcup, Kent, for the treatment of many of our most grievously wounded men? This model institution, with its plastic and dental operating theatres, erected and equipped

on the most scientific principles, will fulfil a great need. The chief among its objects being to remove acute cases of facial and jaw injuries from the atmosphere of crowded hospitals into fresh country air and delightful surroundings, and so give these terrible wounds every chance to heal more rapidly after the frequent operations which are necessary; also to provide cheerful outdoor occupation for the men, who frequently have to remain under treatment for 18 months to two years, and who suffer so acutely from mental depression. Many of the cases are beyond description.

Liberal grants have been made by the British Red Cross Society and Order of St. John and the National Relief Fund towards the cost of building, but a large sum is still required to complete and equip the hospital and workshops and to provide for their upkeep. Donations should be sent addressed to Mr. C. H. Kenderdine, honorary secretary and treasurer, St. Stephen's House, Westminster, S.W. 1, marked "The Queen's Hospital." Cheques should be crossed "Lloyds Bank."—Yours obediently,

FRENCH, F.M., CLARENDON,
CORISANDE RODNEY,
ROSAMOND CORBET,
HEATH HARRISON,
HUGH W. DRUMMOND,
WALTER PEACOCK,
GEO. J. WARDLE.

St. Stephen's House, Westminster, S.W. 1. July 25th, 1917.

IN THE INTEREST OF THE WAR CRIPPLE.

To the Editor of THE LANCET.

SIR,—In your leading article of July 21st under this title occurs the statement that "in this country a pension once awarded can never be taken away or diminished." Is this so? On the contrary, is it not a fact that pensions when first awarded are "temporary pensions," subject to revision at the end of six months or a year? Does not your very next sentence imply this? "The only fact to be determined on pension revision is whether physical disability has been reduced by treatment: the question of earning capacity does not arise." What is the revision for, if not to consider the possibilty of lowering the pension?

May I also comment on the second sentence I have quoted? You say that "the question of earning capacity does not arise." But at the meeting of the board to consider pension revision the disabled man is certain to be asked, "What wages are you getting?" I submit that a consideration of the man's answer is one of the most usual methods of arriving at a decision.

I am, Sir, yours faithfully,

Harley-street, W., July 21st, 1917. PAUL BERNARD ROTH.

*** Our correspondent confuses two separate issues, but we admit that neither we, nor our quoted authorities, were very clear. Temporary pensions are granted in respect of disablement which is likely to be of a temporary nature and these are liable to revision as the disability diminishes. A pension once awarded under the scheduled scale in respect of a lost limb or permanent mutilation can never be taken away or diminished, however proficient the cripple becomes. Revision boards are in any case prohibited from asking what wages a man is earning, and the question of his earning capacity therefore cannot arise.—ED. L.

THE PAY OF MEDICAL OFFICERS IN THE TERRITORIAL FORCE.

To the Editor of THE LANCET.

SIR,—I have read with interest the recent correspondence in your journal on the above subject. There seems to me to exist, however, a very real grievance that, so far, no one has touched upon. A regular Naval or Army doctor may withdraw, at certain periods, from their service with a gratuity that works out at £125 (or 7*s.* per diem reserved pay) for each year of embodied service. The temporary R.A.M.C. officer is paid at the rate of 25*s.* 9*d.* per diem, including ration allowance, which might be taken as equivalent to 15*s.* 6*d.* a day pay, plus 7*s.* reserved pay, plus 3*s.* 3*d.* allowances; and in addition to this he draws a gratuity of £60 a year, which would be on a par with the regular officer's special war bonus, paid on cessation of hostilities. This gratuity or special war bonus, too, does the Territorial Force officer draw (cp. Royal Warrant for Pay, &c., of the Army of 1914, para. 497 (b)), which, taken over a period of four years, works out at an average of £60 a year for each year of embodied service. But his pay is, as a captain, 15*s.* 6*d.* a day—with allowances 20*s.* 3*d.*; he gets nothing in lieu of the reserve pay of the Regular Army as does the temporary officer.

I think the attached table should show the disparity that exists between the three branches of the same service. The pay of captain is taken in all instances. The gratuity of the Territorial Force officer is the average over a period of four years:—

—	(α) Regular.	(β) Temporary.	(γ) Territorial Force.
Pay and allowances	20*s.* 3*d.*	25*s.* 9*d.*	20*s.* 3*d.*
Reserved pay (£125 a year)	7*s.* 0*d.*		Nil.
War bonus	?	£60.	£60 (average for 4 years).
Total per annum from all sources	£490.*	£529.	£413.†

* This does not include any Special War Bonus.
† Calculated on Captain's pay plus second year's bonus.

Surely this is in the inverse ratio of merit? The man who, in peace time, or on outbreak of war, joins at considerable personal sacrifice is paid the least (γ).

He who joins for his own convenience comes next (α)—the army is his profession.

While the man who waits to make a bargain or comes in against his will gets paid most (β).

I am, Sir, yours faithfully,

July 25th, 1917. CAPTAIN, R.A.M.C. (T.F.), Late Surgeon, R.N.

URBAN VITAL STATISTICS.

(Week ended July 28th, 1917.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at nearly 17,000,000 persons, the annual rate of mortality was 11·2 per 1000, and coincided with that recorded in the previous week. In London, with a population exceeding 4,000,000 persons, the death-rate was 10·4, or 0·2 per 1000 below that in the previous week; among the remaining towns the death-rates ranged from 5·5 in Reading, 5·6 in Merthyr Tydfil, and 5·9 in Ilford and in Gillingham, to 19·8 in Rotherham, 22·8 in Stockton-on-Tees, and 23·0 in Middlesbrough. The principal epidemic diseases caused 257 deaths, which corresponded to an annual rate of 0·8 per 1000, and included 95 from infantile diarrhœa, 76 from measles, 42 from whooping-cough, 33 from diphtheria, 7 from scarlet fever, and 4 from enteric fever. The deaths from diarrhœa were 42 in excess of the number in the previous week, and included 23 in London, 11 in Birmingham, 9 in Liverpool, and 6 in Sheffield. Measles caused the highest rates of 1·9 in South Shields, 2·4 in Northampton, and 2·7 in Middlesbrough. The 651 cases of scarlet fever and 1081 of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital were respectively 13 and 14 above the numbers remaining at the end of the previous week. Of the 3645 deaths from all causes in the 96 towns 153 resulted from violence. The causes of 23 deaths were uncertified, of which 6 were registered in Birmingham and 3 each in Liverpool, South Shields, and Gateshead, but not one in London.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2,500,000 persons, the annual death-rate was 12·9, against 13·7 and 12·5 per 1000 in the two preceding weeks. The 273 deaths in Glasgow corresponded to an annual rate of 12·8 per 1000, and included 15 from whooping-cough, 8 from measles, 7 from infantile diarrhœa, and 1 from diphtheria. The 68 deaths in Edinburgh were equal to a rate of 10·7 per 1000, and included 2 each from whooping-cough and infantile diarrhœa and 1 from scarlet fever.

Irish Towns.—The 113 deaths in Dublin corresponded to an annual rate of 14·8, or 0·9 per 1000 in excess of that recorded in the previous week, and included 4 from infantile diarrhœa, 3 from whooping-cough, and 2 from measles. The 87 deaths in Belfast were equal to a rate of 11·5 per 1000, and included 2 each from whooping-cough and infantile diarrhœa.

CENTENARIAN.—Mrs. Elizabeth Wood celebrated the 100th anniversary of her birthday at Chatham on July 28th, having been born on that day in 1817.

THE LATE DR. JAMES NICHOLLS.—James Nicholls, M.D. St. And., M.R.C.P. Edin., F.R.C.S. Eng., who died at St. Columb, Cornwall, on July 28th, in his eighty-seventh year, belonged to an old West of England family and received his medical education at St. George's Hospital and the University of St. Andrews. He was for many years in practice at Wiveliscombe, contributed to THE LANCET, and wrote an article on Excision of the Ankle-joint in Holmes's "System of Surgery." He had a sound knowledge of his professional work, and was an authority on the folk-lore of Cornwall. By his death a highly educated practitioner of the older stamp has been removed from among us.

The War.

THE CASUALTY LIST.

THE following names of medical officers appear among the casualties announced since our last issue :—

Died.

Temp. Surg. E. S. Calthrop, R.N., was a student at Charing Cross Hospital, and qualified in 1909. He held appointments at Charing Cross Hospital and at the London Lock Hospital, and joined the R.A.M.C. in 1911, which he later relinquished.

Lieut. J. S. Munro, R.A.M.C., qualified at Edinburgh in December, 1916, and thereupon joined the R.A.M.C.

Lieut. S. C. Ellison, R.A.M.C., qualified at Edinburgh in 1902. For a short time he worked in Ireland, and was in practice at Small Heath, Birmingham, prior to joining the R.A.M.C. so recently as May last.

Capt. I. Macfarlane, R.A.M.C., qualified at Edinburgh in 1911, and was in practice at Juniper Green, Midlothian, before joining the R.A.M.C.

Lieut.-Col. F. J. C. Heffernan, R.A.M.C., qualified in Ireland in 1897, and held appointments at Meath Hospital and at the Dublin Infirmary. He joined the R.A.M.C. in 1898 and was gazetted Lieutenant-Colonel in March, 1915.

Major J. Aitken, R.A.M.C., qualified at Glasgow in 1891, and was in practice at Ilford, Essex, where he was honorary surgeon to the Merchant Seamen's Orphanage before going on active service. For some years prior to the war he held a commission in the Volunteer and Territorial Forces.

Wounded.

Capt. H. H. Hepburn, R.A.M.C., attached Royal Field Artillery.
Staff-Surg. E. L. Atkinson, R.N.
Capt. E. Mansfield, R.A.M.C.
Capt. E. I. Graves, Australian A.M.C.
Capt. F. Ellis, R.A.M.C.
Lieut.-Col. A. W. F. Sayres, R.A.M.C.
Capt. R. A. Ireland, Canadian A.M.C.
Capt. R. R. G. Atkins, R.A.M.C.

Missing.

Capt. E. D. F. Hayes, R.A.M.C., attached Northampton Regiment.

Previously reported Wounded, now reported Not Wounded.

Capt. J. B. Milne, M.C., R.A.M.C., attached Royal Field Artillery.

CASUALTIES AMONG THE SONS OF MEDICAL MEN.

The following additional casualties among the sons of medical men are reported :—

Major E. C. Fleming, M.C., Royal Field Artillery, killed in action, youngest son of the late Dr. W. J. Fleming, of Glasgow.

Lieut. A. D. L. Browne, Connaught Rangers, killed in action, younger and only surviving son of Colonel L. Browne, A.M.S., of Ilminster, Somerset.

Lieut. I. S. Jefferson, R.N., killed in action, elder son of Dr. W. D. Jefferson, medical officer of health for the city of Ripon.

Lieut. W. S. Ross, killed in action, second son of Dr. D. M. Ross, of Brighton, Sussex.

Second Lieut. A. B. Laxton, Royal Field Artillery, killed in action, second son of the late Mr. T. L. Laxton, M.R.C.S., L.R.C.P., of Pretoria, South Africa.

THE HONOURS LIST.

The following awards to medical officers are announced :—

Distinguished Service Order.

Temp. Capt. Harold Saunderson Sugars, M.C., R.A.M.C.

For conspicuous gallantry and devotion to duty. He showed magnificent disregard of personal safety in attending to the wounded under heavy fire for five days. On the fifth day his leg was broken, but this did not prevent him from going through heavy shell fire to save the life of a corporal whose main artery had been cut and required immediate attention. His fearlessness in crossing the open under continuous and heavy fire to save life or to alleviate suffering was most marked.

Second Bar to Military Cross.

Temp. Capt. Allen Coulter Hancock, M.C., R.A.M.C.

For conspicuous gallantry and devotion to duty. He established his A.D.S. in the village, although it was under very heavy shell fire. He attended and evacuated a very large number of wounded, working all night, finally going out himself along the front to see if there were any left. (The award of the M.C. was recorded in THE LANCET of Dec. 16th, 1916, p. 1034; and of the First Bar in THE LANCET of March 17th, 1917, p. 428.)

Bar to Military Cross.

Temp. Capt. Clarence Randolph Young, M.C., R.A.M.C.

For conspicuous gallantry and devotion to duty in attending to the wounded under heavy fire, with the utmost disregard for his own safety. The trench in which he had established his forward dressing station was blown in in many places by intense hostile barrage, which continued for an hour. His example had a powerful effect on all the stretcher-bearers, and it was entirely due to his resource and coolness that all the wounded were safely evacuated. (The award of the M.C. was recorded in THE LANCET of Nov. 18th, 1916, p. 881.)

Military Cross.

Capt. Arthur Chester Armstrong, Canadian A.M.C.

For conspicuous gallantry and devotion to duty. He displayed great courage and determination in tending the wounded under very heavy fire. His devotion to duty saved many lives.

Lieut. Ivor Aubrey, R.A.M.C., Spec. Res.

For conspicuous gallantry and devotion to duty. He led a party of bearers through heavy shell fire and collected and dressed wounded all night. This work he carried on in daylight under observation from the enemy and heavy fire, carrying back an officer on his back from the enemy wire.

Temp. Capt. John Dorrington Batt, R.A.M.C.

For conspicuous gallantry and devotion to duty in digging out a number of men who had been buried by a shell. Whilst doing so another shell killed and wounded all who were there, and he was partially buried himself. He continued his work of rescuing other men and dressing their wounds, regardless of all danger.

Capt. William Mervyn Biden, R.A.M.C., Spec. Res.

For conspicuous gallantry and devotion to duty. His organisation for the evacuation of the wounded was admirable. With total disregard of danger he personally supervised the stretcher parties, who worked in daylight in full view of the enemy.

Temp. Capt. Maurice Smith Bryce, R.A.M.C.

For conspicuous gallantry and devotion to duty. On three occasions he walked through the enemy's barrage to the captured trenches, where he treated the wounded and took them back to the field ambulance. He set a splendid example by his fearlessness and devotion to duty.

Capt. (actg. Maj.) Harold Buck, Canadian A.M.C.

For conspicuous gallantry and devotion to duty. He led his bearers with great gallantry, and was responsible for the evacuation of a large number of wounded men. He set a fine example to all ranks.

Capt. Alva Burton Chapman, Canadian A.M.C.

For conspicuous gallantry and devotion to duty. One of our planes being shot down he went to the assistance. On his way he was wounded in the head. He continued on his way to the machine, which was being heavily shelled, attended to one of the occupants, and had him carried away.

Temp. Capt. Claude Norman Coad, R.A.M.C.

For conspicuous gallantry and devotion to duty in proceeding alone, under intense enemy barrage, to the aid of a wounded officer, whom he brought back under circumstances of the greatest personal risk over ground swept by enemy fire. He spent the night in No Man's Land, displaying the highest courage and devotion to duty in evacuating the wounded under continual heavy fire.

Capt. Waring Gerald Cosbie, Canadian A.M.C.

For conspicuous gallantry and devotion to duty. He led his bearers into the open under heavy fire and rescued many wounded men. He worked continuously for 48 hours under very heavy fire.

Capt. William Creighton, Canadian A.M.C.

For conspicuous gallantry and devotion to duty when in charge of an advanced dressing station. He took command of a party and searched for wounded for six hours under heavy shell fire, bringing in all our wounded as well as those of the enemy. His gallantry was most inspiring to his men.

Capt. Robert Scott Cumming, R.A.M.C., Spec. Res.

For conspicuous gallantry and devotion to duty. For 36 hours he worked continuously in evacuating and dressing wounded under heavy shell fire. Throughout he set a magnificent example to those under him.

Temp. Capt. Otto De Muth, R.A.M.C.

For conspicuous gallantry and devotion to duty whilst attending to the wounded under very heavy fire. His initiative and total disregard of danger enabled the evacuation of the wounded to be successfully carried out during a very trying period. No personal danger seemed too great for him to face in the performance of his duties.

Temp. Capt. Herman Gerald Dresing, R.A.M.C.

For conspicuous gallantry and devotion to duty. After being shelled out of his dressing station he took up another position and continued throughout the day and performed operations under heavy shell fire, which was causing continual casualties around him.

Temp. Capt. Alexander Galletly, R.A.M.C.

For conspicuous gallantry and devotion to duty in taking bearer parties forward under heavy fire to collect wounded from a front-line trench. His conduct throughout was admirable. He was continually on duty for 48 hours.

Temp. Capt. James Gaston, R.A.M.C.

For conspicuous gallantry and devotion to duty. He attended the wounded of five other units besides his own throughout the day. The next day he led a party out in front and recovered 12 more wounded who were lying out. Throughout he set a splendid example to all.

Temp. Capt. George Charles Gaynor, R.A.M.C.

For conspicuous gallantry and devotion to duty when attending to the wounded. He showed magnificent disregard of danger in going constantly through heavy barrage to fulfil his medical duties, greatly assisting and encouraging all ranks by his example. He has on previous occasions performed similar gallant work.

Temp. Capt. Austin Charles Giles, R.A.M.C.

For conspicuous gallantry and devotion to duty. Though suffering severely from gas poisoning, and unable to stand without assistance, he continued for many hours to attend to wounded and gassed men, refusing to rest himself till all had received attention.

Capt. William Hale, jun., Canadian A.M.C.

For conspicuous gallantry and devotion to duty. He established a dressing station in a forward area, and worked untiringly for 60 hours under fire dressing the wounded. He set a fine example of courage and determination.

Temp. Capt. Robert Hannah, R.A.M.C.

For conspicuous gallantry and devotion to duty in attending to the wounded under very heavy shell fire. He also made four journeys into No Man's Land under shell, rifle, and machine-gun fire, and brought in the wounded and attended to them. He set a magnificent example of fearlessness to the men.

Temp. Capt. Ronald Hodson, R.A.M.C.

For conspicuous gallantry and devotion to duty. When in charge of the bearers he ensured the rapid clearance of wounded by closely following the advance of shell fire. Throughout he set a fine example of coolness and courage.

Capt. Edward Shapter Jeffrey, Canadian A.M.C.

For conspicuous gallantry and devotion to duty. Under continuous shell fire he directed and steadied the stretcher parties. His fine example and courage enabled all wounded to be cleared before nightfall.

Capt. Richard Wellington Kenny, Canadian A.M.C.

For conspicuous gallantry and devotion to duty. He unceasingly attended wounded in his dressing station. He improvised an additional station in an adjacent trench and carried on his work under shell fire. He has done previous good work in the same capacity.

Capt. Charles Kerr, Canadian A.M.C.

For conspicuous gallantry and devotion to duty when in charge of regimental aid-posts. He continually exposed himself to heavy fire, with the result that every wounded man was cleared as soon as his wounds were dressed. He has on several occasions shown most unselfish devotion in the care of wounded.

Capt. Maurice Bertram Lawrie, South African M.C.

For conspicuous gallantry and devotion to duty. At great personal risk he established and carried on an advanced bearer post. He gave a fine example of courage to those under him in the face of heavy shell fire in clearing the forward area of wounded.

Temp. Capt. William Leslie, R.A.M.C.

For conspicuous gallantry and devotion to duty. For six days he was at the A.D.'s, which was shelled almost continuously. His work had to be done out in the open, where there was very little cover owing to the accumulation of cases. His work throughout deserves the highest praise.

Temp. Capt. Joseph Paterson Lusk, R.A.M.C.

For conspicuous gallantry and devotion to duty. He attended the wounded where they fell by the enemy trench under very heavy fire. His disregard of self and consideration for the wounded set a splendid example to all.

Capt. Samuel McCausland, R.A.M.C.

For conspicuous gallantry and devotion to duty. Under very heavy and continuous shell fire he systematically searched from cellar to cellar of a village until he had successfully cleared his part of the village of all wounded. These included many who had been lying there for days, and who could not be moved owing to the intensity of the enemy barrage. He worked unceasingly amidst conditions of the greatest possible danger for 30 hours.

Temp. Lieut. James Wallace Macfarlane, R.A.M.C.

For conspicuous gallantry and devotion to duty. He went through a heavy gas-shell fire to dress a wounded man. Finding it impossible to perform this work with the gas-mask on he removed it at great risk and completed his task before putting it on again.

Temp. Capt. Robert John Bowman Madden, R.A.M.C.

For conspicuous gallantry and devotion to duty. He worked continually for 30 hours under heavy fire, leading and organising stretcher-bearers. Throughout he set a splendid example.

Capt. Robert Paul Scott Mason, R.A.M.C.

For conspicuous gallantry and devotion to duty in tending the wounded of several batteries. To do this he had to pass through very heavy shell fire, and on this, as on previous occasions, he showed absolute disregard of personal danger.

Capt. Hugh Roy Mustard, Canadian A.M.C.

For conspicuous gallantry and devotion to duty in dressing the wounded of a battery in the open exposed to heavy shell fire for two hours. He then continued at an exposed post for three days dressing wounded, and he has on several occasions exhibited great courage and devotion of the same kind.

Temp. Capt. Archibald Gladstone Naismith, R.A.M.C.

For conspicuous gallantry and devotion to duty. When supervising the erection of an A.D.S. he was knocked down and stunned by a shell which wounded most of the party. On recovery he at once attended to the wounded, and remained until this was completed.

Temp. Capt. Kenneth Montague Nelson, R.A.M.C.

For conspicuous gallantry and devotion to duty in attending to the wounded with the utmost fearlessness under heavy shell and machine-gun fire. He constantly went out to our most advanced positions in aid of the wounded, and his careful search of the battlefield resulted in most of the more serious cases being found and brought back to the dressing station. His unselfish devotion was directly the cause of many lives being saved.

Temp. Capt. William Bentley Purchase, R.A.M.C.

For conspicuous gallantry and devotion to duty in attending to a wounded driver, with whom he remained under heavy shell fire until he died, having ordered two of his men to go to a place of safety. He had previously shown exceptional bravery and promptness in responding to a call for medical help earlier in the day, when four officers had been killed by shell fire in the battery.

Temp. Capt. Arthur Carlile Sturdy, R.A.M.C.

For conspicuous gallantry and devotion to duty. He attended wounded for many hours under heavy fire. He showed a complete disregard for danger in organising search parties, and recovered wounded who had been left for several days.

Capt. Donald George Kennedy Turnbull, Canadian A.M.C

For conspicuous gallantry and devotion to duty. He showed continual fearlessness and splendid devotion in making his way under the heaviest fire to the most advanced parts of the battlefield to establish dressing stations and attend to the wounded. No undertaking seemed too perilous for him; he constantly dressed wounded in the front line, and the example he set to his stretcher-bearers and carrying parties was at all times beyond all praise.

Capt. Joseph Stephen Wallace, R.A.M.C.

For conspicuous gallantry and devotion to duty when in charge of bearer parties, in so organising and handling his stretcher-bearers amidst heavy shell and gas barrage that a very large number of our wounded were brought in to safety. His conduct was conspicuous throughout for coolness, good judgment, and total disregard of danger. He had been knocked out by gas the day before, but insisted on remaining at his post.

Capt. John Rollo Noel Warburton, R.A.M.C.

For conspicuous gallantry and devotion to duty. He showed great courage and devotion in his treatment of wounded. The press of cases was very heavy, and he worked all night and the next day.

Temp. Capt. John Victor Williams, R.A.M.C.

For conspicuous gallantry and devotion to duty. He took a party of bearers up and, crossing the open under very heavy shell fire, dressed all the wounded and returned with them, going out later and coming in with the lost squads. He worked for four nights and days.

MENTIONED IN DESPATCHES.

The names of the following medical officers are gazetted for distinguished services rendered in connexion with the war:—

Staff, &c.—Hon. Col. C. J. Bond, Consulting Surgeon, Northern, Command; Surg.-Lt.-Col. Sir W. R. Crooke-Lawless, C.B., C.I.E., Res. of Off.; Maj. and Bt. Lt.-Col. (temp. Brig.-Gen.) A. C. Geddes, C.B., Unattached List (T.F.); Col. Sir J. Magill, K.C.B., ret. pay; Col. A. Peterkin, ret. pay, late A.M.S.; Surg.-Gen. R. H. Quill, ret. pay, late A.M.S.; Surg. Lt.-Col. (Hon. Surg. Col.) R. J. Reece, C.B., H.A.C.

I.M.S.—Sir R. N. Campbell, K.C.M.G., C.B., C.I.E., retd.; Lt.-Col. J. Chaytor-White, C.M.G., retd.; Lt.-Col. Sir P. J. Freyer, K.C.B., retd.; Lt.-Col. J. N. MacLeod, C.M.G., C.I.E., retd.; Lt.-Col. F. F. Perry, C.M.G., C.I.E., retd.; Lt.-Col. J. C. Robertson, C.I.E.; Lt.-Col. and Bt.-Col. Sir B. G. Seton, Bart., C.B.; Lt.-Col. S. B. Smith, C.M.G.; Lt.-Col. T. H. Sweeny, C.M.G., retd.

Army Medical Service.—Surg.-Gen. J. C. Culling; Temp. Col. J. Galloway, C.B.; Col. (temp. Surg.-Gen.) R. S. F. Henderson, K.H.P.; Col. R. J. S. Simpson, C.M.G., ret. pay; Col. C. R. Tyrrell, C.B., ret. pay; Col. D. Wardrop, C.B., C.V.O., ret. pay; Col. (temp. Surg.-Gen.) M. T. Yarr, C.B.

R.A.M.C.—Temp. Lt.-Col. W. N. Barron, M.V.O.; Lt.-Col. J. M. Cotterill; Temp. Hon. Lt.-Col. M. H. Gordon, C.M.G.; Lt.-Col. D. Harvey, C.M.G.; Maj. G. A. D. Harvey, C.M.G.; Surg. Lt.-Col. and Hon. Surg.-Col. D. Hepburn; Lt.-Col. H. Littlewood; Temp. Lt.-Col. W. L. W. Marshall; Maj. P. S. O'Reilly, C.M.G.; Lt.-Col. G. S. A. Ranking, late I.M.S.; Temp. Maj. A. D. Reid, C.M.G.; Lt.-Col. W. Turner, retd.

Australian Army Medical Corps.—Lt.-Col. W. T. Hayward, C.M.G.; Lt.-Col. T. B. V. Hurley, C.M.G.; Col. R. J. Millard, C.M.G.

Canadian Army Medical Corps.—Col. C. A. Hodgetts, C.M.G.; Col. D. W. McPherson; Col. G. S. Rennie.

New Zealand Medical Corps.—Maj. (temp. Lt.-Col.) H. T. D. Acland; Lt.-Col. B. E. Myers; Maj. (temp. Lt.-Col.) D. S. Wylie.

FOREIGN DECORATIONS.

Belgian.

Ordre de Léopold: Chevalier.—Temp. Capt. M. Coplans, D.S.O., R.A.M.C.

ROYAL MEDICAL BENEVOLENT FUND: WAR EMERGENCY FUND.

A private meeting of those interested in the War Emergency Fund of the Royal Medical Benevolent Fund was held at 11, Chandos-street, London, W. 1, on Tuesday last and was well attended. Besides the office-bearers of the Benevolent Fund itself there were present, amongst others, the President and the treasurer of the Royal College of Physicians of London, the Deputy Director-General of

the Army Medical Service, the president of the Society for the Relief of Widows and Orphans of Medical Men, the chairman of the Royal Army Medical Auxiliary Funds, the treasurer and secretary of the British Medical Association, Sir Thomas Barlow, Sir Rickman Godlee, and representatives of the Officers Families' Fund and of the Professional Classes Relief Fund. The relation of the War Emergency Fund to other funds was fully discussed, as well as the best means of making it an effective means of relief, especially on demobilisation, without overlapping the work of any other agency. It was decided to prepare a statement in support of a further appeal and to bring the claims of the fund before a public meeting later in the year.

An American Unit for Physical Treatment.

We have received from Dr. Benham Snow, of New York, a synopsis of the medical unit which the American Electro-therapeutic Association, of which Dr. Snow is chairman, propose to equip for treating the disabled soldier. The synopsis is as follows:—

1. *Purpose.*—The purpose of the unit is to furnish facilities and men to carry out in a thoroughly scientific manner treatment, by electro-therapeutic and other physical methods, of diseased conditions arising from injuries and from other causes associated with exposure of our men in the Army at the front.

2. *Scope.*—(*a*) Includes the treatment of infected wounds, delayed repair following injury, beginning gangrene, sprains, contusions, atrophies, various forms of arthritis, erysipelas, frost-bite, trench feet, flat-foot, and neuritis. (*b*) Instruction to physicians and nurses in preparation for the above work.

3. *Capacity and cost.*—In order to carry out this work properly sufficient funds must be provided to thoroughly equip and maintain a unit. The committee recommends that such a unit form a part of every base hospital in this country and abroad. There are qualified physicians in readiness to fill these positions.

4. *Equipment.*—Equipment should include transformers and diathermic apparatus, X ray apparatus for therapeutic use, the practical forms of static machines, therapeutic lamps, sinusoidal machines, and constant current apparatus.

The attachment of such a unit to every hospital at the front and at the base is in harmony with the recommendations of the Paris Conference on the War Cripple which we recently published.

A Hospital for Facial and Jaw Injuries.

As the war has gone on the need for special hospitals has become more and more recognised, with a view to an economy of effort. Plastic surgery, which has been extensively carried out in various places, is now to be dealt with in certain centres where concentration of material and operators will tend to give the best results. Fractured jaws have been found to entail much surgical and dental treatment before they are ready for plastic work, and such preparation forms a large part of the hospital work required in such cases. The Queen's Hospital at Frognal, Sidcup (Kent), an appeal for which appears in our correspondence columns, owes its inception to Mr. C. H. Kenderdine, one of the originators of Queen Mary's Hospital at Roehampton. It has been established to deal with facial and jaw injuries, and aims at restoration by means of surgical procedure, with a resort to the use of artificial features only in extreme cases.

Facial plastic surgery implies the building up of the features and restoration of contour from the patient's own tissues, with the transference for this purpose of portions of skin, bone, or cartilage. A museum has recently been started at the hospital containing pastel drawings of the condition of wounds before and after treatment by Professor Henry Tonks, F.R.C.S. Eng., whose help and that of the sculptor, Mr. J. W. Edwards, have contributed much to the work of the surgeons.

The chief consulting surgeon to the Queen's Hospital is Sir Arbuthnot Lane, Bart., who is assisted in the special plastic work by Captain H. D. Gillies, R.A.M.C., Captain J. L. Aymard, R.A.M.C., and a staff of dental surgeons and skilled mechanics. It is hoped that recovery will be greatly accelerated by the situation of the hospital in country air. A home farm and poultry farm form a part of the scheme, occupation being found for the men approaching convalescence, with a view of saving them from the mental depression by which many are beset. Workshops also are being established where practical instruction will be given in estate carpentry and other handicrafts.

Payment for Treatment of the War Cripple.—The important question of increased payment to the panel practitioner on account of disabled sailors and soldiers coming under his care—a contingency not foreseen when the basis of insurance practice was fixed—has been cleared up by Mr. H. B. Brackenbury's statement at the Representative Meeting of the British Medical Association. The Treasury, he said, had agreed to an arrangement of payment per attendance on these cases and to make up the money required in excess of the pool at present available under the Insurance Acts.

King George's Fund for Sailors.—Among the great institutions in the country which minister to the needs of the seafaring community in the Navy and the Merchant Service, or engaged in mine-sweeping or fishing, are the various seamen's hospitals and orphanages. Owing to the war heavy calls have been made upon these marine charities, and heavier remain to be made. To meet the need for their fuller and more sustained support King George's Fund for Sailors has been founded, with His Majesty the King as Patron, H.R.H. Prince Albert as President, and H.R.H. the Duke of Connaught as Chairman. All contributions should be addressed to the Duke of Connaught, King George's Fund for Sailors, Trinity House, E.C. 3.

Military Hospital Ships.—Little about hospital ships has been published during the war: we therefore welcome a paper on his experiences afloat by Dr. Oudard, staff-surgeon of the French Navy, which has recently appeared in the *Archives de Médecine Navales*. He notes that the French have long employed hospital ships in their colonial wars, and that indeed in 1877 they built the *Annamite* as a hospital ship. She turned out so well that five others followed her, giving in his experience greater satisfaction than can be obtained from any converted merchantman. He wishes to see a fleet of steady ships built, about 10,000 tons and 15 knots, leased in peace time to commercial companies as passenger steamers, available at once on the outbreak of war, and each carrying 600 bad cases in single-tier cots. This is done in Japan. The worst cases would be in a ward with two operating theatres adjacent, while a small room for dressing cases is to be an annexe to each of the other wards. The ships are to be planned for easy loading without too steep gangways; that means, we suppose, a suitable entry-port or baggage-port on each deck, doors and passage ways are to be wide enough to admit stretchers easily, and there are to be suitable derricks, or cranes, for hoisting and lowering patients in rough weather. These desiderata are quite in line with English practice, though we have few hospital ships specially built as such. He tells us of the help the French hospital ships were to the army at the beginning of the war, when the battles of the Yser were being fought, and the wounded were many. The ship would lie in a northern Channel port and at first she took the wounded as they were brought down by trains or ambulances, straight off the field. When the ship was as full as she could hold, about twice her calculated capacity, she would put to sea, and in a few hours discharge her patients somewhere in the west, every exertion having been made on board for the wounded, though little, except what was urgently necessary, could be achieved. Still, the wounded were greatly better off on shipboard, the pitching and rolling of a ship being far better borne, particularly by fracture cases, than the constant jolting of a train. Later on, as additional hospital ships came into service, they were less hurried, and could lie at bases, doing the duty of comfortable base hospitals, in France, at Mudros, and elsewhere. Popular report in the army credits the French hospital ships with a great deal of good work. The question of personnel is important. Dr. Oudard requires 10 orderlies for every 100 patients. In the hospital ships or barges used by the Austrians on the Danube and Save, and only employed over short distances, there were 12 orderlies for every 100 "lying" cases and four for every 100 "sitters."[1]

[1] Military Surgeon, vol. xl., p. 651. June, 1917.

THE SERVICES.

ROYAL NAVAL MEDICAL SERVICE.

Fleet-Surg. J. E. Coad, R.N., is placed on the Retired List with rank of Deputy Surgeon-General.

To be temporary Surgeons: T. S. Duncan, A. R. Matheson, A. T. Woodward, W. W. Forsyth.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. R. Wilbond to be Staff-Surgeon.

ARMY MEDICAL SERVICE.

Col. C. A. Lane is retained on the Active List and to be supernumerary.

Lieutenant-Colonels to be temporary Colonels whilst employed as Assistant Directors of Medical Services of a Division: G. St. C. Thom, C.M.G., J. W. H. Houghton.

ROYAL ARMY MEDICAL CORPS.

Lieut.-Col. J. D. Ferguson, C.M.G., D.S.O., to be temporary Colonel whilst specially employed.

Major (temp. Lieut.-Col.) T. H. Gibbon relinquishes his temporary rank on re-posting.

To be temporary Lieutenant-Colonels: T. McCrae, Canadian A.M.C., Temp. Major J. R. Speir, Canadian A.M.C.

Majors to be acting Lieutenant-Colonels whilst holding the appointment of Assistant Director of Medical Services of an Army: P. Davidson, C.M.G., D.S.O., W. F. Tyndale, C.M.G.

Temp. Hon. Lieut.-Col. C. H. Fagge (Major, R.A.M.C., T.F.) relinquishes his temporary rank on re-posting.

The undermentioned are granted temporary rank:—As Lieutenant-Colonels: Temp. Hon. Major T. G. Moorhead, T. E. Gordon. As Majors: C. P. Ball, A. J. McA. Blayney, D. Kennedy. As Captains: R. J. Rowlette, W. J. Corbett, G. E. P. Meldon, M. R. J. Hayes.

Major A. C. Duffey is restored to the establishment.

Temp. Major G. E. Gillies, Canadian A.M.C., to be temporary Major.

Captains to be Majors: J. S. Dunne, A. D. O'Carroll.

The undermentioned temporary Captains to be temporary Majors whilst employed at the Keighley War Hospital: H. S. Brander, J. N. Doble, J. M. Crocker.

Temp. Capt. T. Walcot to be acting Major whilst commanding troops on a hospital ship.

G. B. Hillman, late temporary Captain, to be honorary Captain.

Lieutenants to be temporary Captains: C. B. G. Anderson, P. E. D. Pank, G. Moulson.

Temporary Lieutenants to be temporary Captains: J. M. Taylor, H. T. Jameson, J. McMurray, J. L. O. Tilley, D. W. Roy, H. E. Brown, J. Monroe, A. E. Rayner, H. F. Bodvel-Roberts, S. J. W. Donald, J. S. Rowlands, D. Ranken, W. Fraser, W. K. Connell, W. D. Allan.

To be temporary Captains: H. W. Whytock, Canadian A.M.C., D. A. Murray, Canadian A.M.C., W. J. Bell, Canadian A.M.C., A. Levy, A. Wilson, E. H. Lawson, A. E. Kelsey, late Fleet-Surgeon, R.N., S. A. Montgomery, R. W. Russell-Jones, J. S. K. Smith, R. V. Dolby, L. C. Smith, R. G. Riches.

Temp. Hon. Lieut. S. Wicks to be temporary honorary Captain whilst employed with No. 8 British Red Cross (Baltic and Corn Exchange) Hospital.

To be temporary Lieutenants: H. F. MacKendrick, E. B. Struthers, C. G. G. Winter, G. R. Phillips, T. S. Greenaway, R. T. St. J. Brooks, H. E. Gray, D. G. Halsted, J. L. McCann, S. D. Bridge, E. H. R. Harries, W. W. Walker, A. M. Hewat, D. Burrows, J. A. Loughridge, J. A. Clarke, H. M. Raven, R. M. Menzies, G. E. Beaumont, G. Taylor, W. A. Mahon, W. A. Wilson-Smith, G. H. H. Almond, H. Chapple, R. McN. Wilson, G. M. Coope, A. F. Sanderson, A. M. Jones, G. S. Gordon, A. Rhodes, M. Hocken, N. K. Foster, J. C. Middleton, A. Allison, C. W. Ewing, R. Wade, C. Beards, E. D. W. Reid, C. R. Wilkins, K. H. Bennett, A. L. Robinson, J. S. Leslie, W. O'Donnell, E. R. Holborow, F. H. Flack, S. S. M. Wood, G. J. Eady, D. Martin, H. Sinson, W. M. Hume, J. Hunter, A. Brown, A. Brownlie, J. H. Thompson, J. E. R. McDonagh, L. G. Leonard, D. A. Stewart, C. Garner, C. A. H. Gee, W. A. I. Marriott, W. J. Ashby, J. A. Brown, T. N. Wilthew, W. Murray, F. Butler, A. White, D. McC. Aitken, J. D. Kenyon, W. J. McFeat, R. J. Archibald, T. D. Graham, D. A. Chamberlain, O. C. Johnson, H. J. Van Praagh, W. B. M. Martin, R. N. Berman, J. S. Simpson, A. Bradshaw, A. G. Craib, D. M. McGillivray, A. D. Yule, W. Gorrie, W. J. Taggart, W. Boyd, T. W. Bayne, G. B. Charnock, R. Parry, W. E. Cooper, G. B. Warburton, G. Cockcroft, G. Newstead, W. Angus, A. W. K. Straton, J. K. Willis, F. B. O'Dowd, G. H. Mead, V. Glendining, J. Pender, R. J. Reynolds, B. Blackwood, J. H. Sutcliffe, G. R. Potter, H. H. Jenkins, J. K. Hamilton, G. A. Rorie, A. S. Campbell.

To be temporary honorary Lieutenants: R. M. Bradley, G. W. Stephens, J. B. Fearn, W. H. Irish.

Officers relinquishing their commissions: Temp. Capts. R. F. Yencken (on account of ill-health), W. C. Gowdey, V. G. Williams, W. F. McGlashan, H. Grey; Temp. Lieuts. H. D. Gasteen, A. K. Henry, V. A. Crinks, S. B. Turner, A. E. Hunter, D. P. Lucey, R. E. Marwick, A. P. F. Gammack, G. P. G. Beckett, C. L. Hawkins, W. D. Hopkins, G. W. Renton, A. J. Stanley, J. A. Aitken, J. Aylen, J. M. Coplans (on account of ill-health); Temp. Hon. Lieuts. A. Banks and W. B. Hayes (having ceased to be employed with No. 8 British Red Cross (Baltic and Corn Exchange) Hospital).

SPECIAL RESERVE OF OFFICERS.

To be Lieutenants: O. M. Mirylees, D. McKay Sutherland (from Manchester University Contingent O.T.C.), W. L. Agnew.

Lieut. (on probation) A. W. D. Magee relinquishes his commission.

TERRITORIAL FORCE.

Major (temp. Lieut.-Col.) W. L. Bentley relinquishes the temporary rank on alteration in posting.

Major (temp. Lieut.-Col.) H. A. Ballance is seconded for duty with a General Hospital, and to retain his temporary rank whilst so employed.

Major P. R. Ash to be acting Lieutenant-Colonel whilst commanding a Field Ambulance.

Major W. M. Hamilton relinquishes his commission on account of ill-health.

Capt. (temp. Major) L. A. Dingley relinquishes his temporary rank on ceasing to command a Field Ambulance.

Capt. (temp. Major) A. A. Hingston to be acting Lieutenant-Colonel whilst commanding a Field Ambulance.

Capt. (temp. Major) F. W. Johnson to be Major.

Capt. Hastings F. Everett is granted the rank of temporary Major whilst commanding troops on a Hospital Ship.

Capt. J. H. Baldwin, from T.F.R., to be Captain.

Lieuts. R. Grey and F. Simmers to be Captains.

VOLUNTEER FORCE.

C. L. Fraser, 5th Battalion, Northumberland Volunteer Regiment (late Lieutenant-Colonel, Royal Army Medical Corps, T.F.), to be temporary Captain.

Temp. Lieut. and Medical Officer G. Cowen, 5th Battalion, Surrey Volunteer Regiment, resigns his commission.

A MONTHLY RECORD OF ATMOSPHERIC POLLUTION.

COMMITTEE FOR THE INVESTIGATION OF ATMOSPHERIC POLLUTION: SUMMARY OF REPORTS FOR THE MONTHS ENDING *Feb. 28th, 1917.*

Place.	Rainfall in millimetres.	Metric tons of deposit per square kilometre. Insoluble matter. Tar.	Carbonaceous other than tar	Ash.	Soluble matter. Loss on ignition.	Ash.	Total solids.	Included in soluble matter. Sulphate as (SO_3).	Chlorine (Cl).	Ammonia (NH_3).
ENGLAND.										
Leicester	19	0·05	3·89	7·21	1·01	2·59	14·76	1·53	0·23	0·14
London—										
Meteorological Office	25	0·06	1·72	2·19	2·20	3·30	9·47	0·95	1·06	0·05
Embankment Gardens	18	0·13	2·61	4·81	1·56	3·91	13·01	1·79	0·68	0·04
Finsbury Park ...	26	0·08	1·08	2·78	4·16	9·76	17·87	5·81	0·16	0·00
Ravenscourt Park	36	0·16	1·76	4·62	4·24	8·03	18·81	4·59	0·08	0·01
Southwark Park	18	0·04	2·03	4·43	3·37	5·85	15·72	3·37	0·84	0·04
Golden Lane ...	21	0·08	2·26	2·93	1·49	3·31	10·06	1·45	0·73	0·11
Malvern	31	0·02	0·24	1·35	0·49	1·97	4·08	0·69	0·23	0·01
Manchester—										
Queen's Park ...	26	—	—	—	—	—	9·70	—	—	—
School of Technology	22	—	—	—	—	—	14·54	—	—	—
Newcastle-on-Tyne	21	0·31	4·98	8·62	1·25	3·28	18·43	1·45	0·44	0·03
Rochdale	34	0·23	3·05	3·82	—	—	8·82	—	—	—
St. Helens	38	0·35	5·05	6·13	3·34	20·76	35·63	7·81	3·44	0·27
York	21	0·10	0·73	0·56	2·66	4·15	8·21	2·22	0·58	0·05
SCOTLAND.										
Coatbridge	17	0·17	2·42	8·66	1·60	2·61	15·46	1·35	0·12	0·07

COMMITTEE FOR THE INVESTIGATION OF ATMOSPHERIC POLLUTION: SUMMARY OF REPORTS FOR THE MONTHS ENDING *March 31st, 1917.*

Place.	Rainfall in millimetres.	Metric tons of deposit per square kilometre. Insoluble matter. Tar.	Carbonaceous other than tar	Ash.	Soluble matter. Loss on ignition.	Ash.	Total solids.	Included in soluble matter. Sulphate as (SO_3).	Chlorine (Cl).	Ammonia (NH_3).
ENGLAND.										
Leicester...	32	0·11	2·20	3·76	1·30	2·21	9·57	1·05	0·40	0·14
London—										
Meteorological Office...	42	0·13	1·63	4·10	2·85	1·35	10·06	1·51	0·86	0·14
Embankment Gardens	26	1·13	8·75	28·44	2·40	5·00	45·72	2·65	0·73	0·05
Finsbury Park ...	36	0·18	2·66	11·46	3·98	6·97	25·26	4·08	0·68	0·08
Ravenscourt Park	47	0·30	2·92	7·95	2·29	5·59	18·99	3·09	0·65	0·08
Southwark Park...	41	0·10	3·50	5·76	4·81	9·26	23·42	5·22	1·23	0·10
Wandsworth Com.	26	0·02	0·68	2·00	1·56	3·54	7·79	2·01	0·68	0·09
Golden Lane ...	42	0·04	3·22	4·41	1·35	4·72	13·73	2·17	0·90	0·21
Malvern	58	Tr.	0·11	0·30	1·26	2·60	4·30	0·90	0·28	0·02
Manchester—										
Queen's Park ...	42	—	—	3·13	—	—	11·75	—	—	—
School of Technology	36	—	—	5·71	—	—	15·84	—	—	—
Newcastle-on-Tyne	44	0·03	1·28	1·31	1·94	3·44	8·00	2·09	1·25	0·18
Rochdale...	77	0·25	8·28	15·79	—	—	29·75	—	—	—
St. Helens	123	0·92	9·55	20·85	7·04	20·72	59·08	7·60	4·75	0·42
SCOTLAND.										
Coatbridge	53	0·18	2·88	9·17	2·80	5·03	20·06	2·89	0·52	0·26

Tr. = Trace.

Owing to frost there were no returns from the Metropolitan Stations, Victoria Park and Wandsworth Common, in February, and for the same reason from Victoria Park in March.

"Tar" includes all matter insoluble in water but soluble in CS_2. "Carbonaceous" includes all combustible matter insoluble in water and in CS_2. "Insoluble ash" includes all earthy matter, fuel, ash, &c. One metric ton per sq. kilometre is equivalent to: (*a*) Approx. 91b. per acre: (*b*) 2·56 English tons per sq. mile; (*c*) one gramme per sq. metre; (*d*) 1/1000 millimetre of rainfall.

The personnel of public health authorities concerned in the supervision of these examinations and of the analytical work involved remains the same as published in previous tables.

Medical News.

ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—At a meeting of Comitia of the Royal College of Physicians and of the Council of the Royal College of Surgeons on July 26th, licences to practise and diplomas of Member were respectively conferred upon 97 candidates (including 14 ladies) who have passed the Final Examination in Medicine, Surgery, and Midwifery of the Conjoint Board and have complied with the necessary by-laws. The following are the names and medical schools of the successful candidates:—

Arthur Lawrence Abel, University College; Hector Demetrius Apergis, Guy's; Roy Douglas Aylward, London; Fritz Ernest Bendix, Middlesex; Herbert Richard Bickerton, Cambridge and Liverpool Universities; Joseph Erwin Adolphe Boucaud, St. Bartholomew's; Arthur Granville Brett, Liverpool University; Ernest Horace Bryant and William Barnes Buer, Guy's; Harold Robert Buttery, Cambridge University and St. Bartholomew's; Octavius Cyril Carter, London; Bodh Raj Chaudhri, St. Mary's; Wilfrid Edward Le Gros Clark, St. Thomas's; Albert Benjamin Cocker, Guy's; Apollo John Cokkinis, St. Mary's; Ernest James Coombe, St. George's; Walter Tyrrell Cooper, Charing Cross; Alexander John Copeland, Glasgow and Cambridge Universities and St. Bartholomew's; Dorothy Trevor Daintree, Royal Free; John Ralph Dingley, University College; Phyllis Decima Dixon, Royal Free; Howard Branson Dodwell, Cambridge University and University College; Herbert Wilfred Eidison, Cambridge University and Guy's; Constance Maud Edwards, Liverpool University; Florence Marjory Edwards, Royal Free; Monte Edwards, St. Thomas's; William Eldinow, London; Johan Sarel Eloff, Cambridge University and St. Thomas's; Edwin Francis Fernando, St. Mary's; Dorothy Gilfort, Royal Free and St. Mary's; Ernest Howard Glenny, St. Bartholomew's; John William Hawksley Grice, Guy's; John Hale, Cambridge University and St. Thomas's; Joan Hardy, Royal Free; Edwin Gabriel Harris, London; Lionel George Higgins, Cambridge University and St. Thomas's; Kenneth Reed Hill, University College; Abdel Halim Hilmy, Cairo and St. Thomas's; Bertha Hinde, Royal Free; *Edward Thomas Hoidge, Toronto University and Middlesex; John Francis Howells, University College; John Bruce Irving, St. Bartholomew's; Seka Marikar Mohamed Jabir, Cambridge University and Guy's; Theodora Johnston, Royal Free and St. Mary's; Henry Cyril Conwy Joyce, St. Bartholomew's; Salomon Kadinsky, Brussels and Westminster; Haji Hyderali Khan, Bombay University, Guy's, and Middlesex; Charles Hardiman Laver, Guy's; Francis Reginald Law, Leeds University; Hilda Mary Lazarus, Madras University; Lloyd Kirwood Ledger, St. Bartholomew's; Harold Mason Leete, Durham University; Alexander Gordon Finley McArthur, Cambridge University and St. Thomas's; Ruby Eva McBirnie, Liverpool University; Kenneth McFadyean and Bruce Maclean, University College; Noel Heathcote Seton Maelzer, Guy's; Walter Harry Maudling, University College; Ambadi Krishna Menon, Madras and London; Puthiyaveettil Narayana Menon, University College; Palliyarallelage Don Jeronis Milanius, Ceylon Medical College and Middlesex; Farid Mohamed, Cairo and Westminster; Hugh Gladstone Morris-Jones, Glasgow and Liverpool Universities; Canapathy Pillai Nagamuttu, Ceylon Medical College and Middlesex; Martin Herbert Oltershaw, University College; Noel Olivier, Royal Free; Sydney Watson Page, Cambridge University and St. Bartholomew's; *Eleanor Joyce Partridge, Royal Free; Arthur McLean Pickup, Birmingham University and University College; Walter Ericksen Powell, Charing Cross; Stephen Henry de Grave Pritchard, London; Marianne Olive Ramsay, Royal Free; Sidney Riddlough, Cambridge University and Guy's; Sophie Sarah Rosenberg, Liège University and Royal Free; Henry Rowan, University College; Khurshedjee Jamsedjee Rustomjee, Liverpool University; John Francis Ryan, St. Thomas's; Samuel Sacks, London; Ahmad Hussein Samy, Cairo and St. Bartholomew's; Thomas Wilson Shaw, Durham University; Kildare Lawrence Singer, Middlesex; †Edward Ernest Smith, Manchester University; Phineas Alex Smuts, St. Bartholomew's; James Randolph William Stephens, Manchester University; Harold James Rocke Surrage, Cambridge University and King's College; Raymund Theron, London; Thomas Benjamin, St. Mary's; Charles Maitland Titterton, St. Bartholomew's; Douglas James Valentine, London; Jeremias Auret van Hoorden, St. Bartholomew's; Jose Victory, Costa Rica and Guy's; George Humphry Ward, Cambridge University and St. Thomas's; Frederick William Arbuthnot Watt, London; Ralph Edwin Stuart Webb, Middlesex; James de Silva Wijeyeratne, University College; Alfred Frank Wyatt and Shebsell Yahilevitz, London; and George Zachariah, Madras University.

* Diploma of M.R.C.S. conferred previously.

† M.R.C.S. diploma alone conferred under Regulations prior to Oct. 1st, 1884.

Diplomas in Public Health were jointly conferred upon the following successful candidates:—

Luis Gregorio Chacin-Itriago, St. Bartholomew's Hospital and King's College; Herbert Davies, Middlesex Hospital and University College; Mostafa Dia, Cairo, St. Mary's Hospital, and Royal Institute of Public Health; Muriel Ann Lloyd, Royal Free Hospital and University College; and Robert Septimus Walker, Edinburgh and University College.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—A Comitia was held on July 25th, Sir Frederick Taylor, Bart., being in the chair. Dr. E. P. Poulton was admitted as a Fellow of the College. Licences to practise physic were granted to 97 candidates who had passed the necessary examinations, and Diplomas in Public Health were granted in conjunction with the Royal College of Surgeons of England to five candidates. The election of Censors, other College officers, members of committees and examiners then took place with the following result:—

Censors.—Dr. S. H. West, Dr. H. W. G. Mackenzie, Dr. S. P. Phillips, and Dr. F. W. Mott.

Treasurer.—Sir Dyce Duckworth.

Emeritus Registrar.—Dr. E. Liveing.

Registrar.—Dr. J. A. Ormerod.

Harveian Librarian.—Dr. Norman Moore.

Members of the Library Committee.—Dr. G. N. Pitt, Dr. A. F. Voelcker, Dr. C. Ogle, and Dr. T. H. A. Chaplin.

Curators of the Museum.—Dr. J. Mitchell Bruce, Sir Seymour J. Sharkey, Dr. F. W. Andrewes, and Dr. W. Hunter.

Finance Committee.—Dr. S. P. Phillips, Dr. A. T. Davies, and Dr. H. R. Spencer.

Examiners.—Chemistry: Dr. W. H. Huntley and Mr. T. M. Lowry. Physics: Mr. A. W. Porter and Mr. J. H. Brinkworth. Practical Pharmacy: Dr. R. A. Young, Dr. D. Forsyth, Dr. W. M. Stevens, Dr. F. L. Golla, and Dr. Edward Mellanby. Physiology: Dr. F. A. Bainbridge and Professor W. M. Bayliss. Anatomy: Dr. E. Barclay-Smith. Medical Anatomy and Principles and Practice of Medicine: Dr. A. G. Barrs, Dr. F. J. Wethered, Dr. J. Calvert, Dr. W. Hunter, C.B., Dr. H. G. Turney, Dr. J. Fawcett, Dr. A. M. Gossage, Dr. J. S. Collier, Dr. F. J. Pynton, and Sir John F. H. Broadbent. Midwifery and Diseases Peculiar to Women: Dr. G. F. Blacker, Dr. T. G. Stevens, Dr. H. J. M. Playfair, Dr. W. F. Victor Bonney, and Mr. G. B. Smith.

Public Health.—Part I.: Mr. J. H. Ryffel. Part II.: Dr. S. A. M. Copeman.

The following communications were received:—1. From the secretary of the Royal College of Surgeons of England, reporting proceedings of the Council of that College on May 10th, June 14th, and July 23rd. 2. From the assistant secretary of the Local Government Board, enclosing communications from the Foreign Office, and asking the College to nominate a delegate to the proposed conference of representatives of Entente States to be held at Monaco after the war. Sir Bertrand Dawson was nominated. 3. From Mrs. Johnson, daughter of the late Dr. Robert Bentley Todd, stating that her sister, the late Miss Elizabeth M. Todd, had bequeathed a bust of Dr. Todd to the College. The gift was accepted with thanks. Dr. James Galloway was elected a member of the Committee of Management in place of the President, who had resigned from the committee. Dr. Norman Moore expressed the thanks of the College to the President for his long services on the committee. The Baly Medal was awarded to Professor W. M. Bayliss, F.R.S. The President announced that he had awarded the Bisset-Hawkins Memorial Medal to Sir Arthur Newsholme. Dr. Hector Mackenzie was appointed a representative of the College upon the medical board of the University of Wales, in the place of Sir Richard Douglas Powell, who had resigned. The President proposed the formation of a committee to consider and report to the College upon the method of application of the sum of £500, given to the College by Mr. F. W. Mitchell, through Dr. E. Malins, for the investigation and treatment of tuberculosis. The proposal was adopted and the President nominated the following Fellows to form the committee: Dr. S. A. Monckton Copeman, Dr. Hector Mackenzie, Dr. P. Horton-Smith Hartley, Dr. T. H. A. Chaplin, Dr. J. Calvert, Dr. J. Fawcett, and Dr. E. Malins. After some further formal business the President dissolved the Comitia.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—An ordinary meeting of the Council was held on July 26th, Mr. Charters J. Symonds, the senior Vice-President, being in the chair. It was resolved to grant diplomas of Membership to 96 successful candidates. In accordance with a report from the Committee of Management, it was resolved to alter the regulations of the Preliminary Examinations in General Education; the chief change is the removal of Latin as a compulsory subject. Mr. F. F. Burghard was elected a member of the Court of Examiners. Mr. H. J. Waring was elected a member of the Board of Examiners in Dental Surgery and Mr. W. H. Dolamore was re-elected a member of the same board. The secretary reported that the new by-laws had been signed by the Secretary of State for Home Affairs, the Lord Chancellor, and the Lord Chief Justice, and that they would have effect at the next election of members of Council. The secretary reported that Mrs. A. H. Johnson had offered to present to the College a bust in alabaster, by Noble, of her father, the late Dr. Robert Bentley Todd, F.R.S. The Council accepted the offer with thanks. The Council accepted with thanks the gift of a crayon drawing of Luther Holden by T. Gordon Stowers, presented by the artist.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH, ROYAL COLLEGE OF SURGEONS OF EDINBURGH, AND ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—The following candidates were successful at examinations recently held:—

SECOND EXAMINATION.

George Harold Potter, Jessie Melville Lyell Wright, William Barton, William Ryding Bennette, James Innes Coventry, and Andrew Gold.

THIRD EXAMINATION.

Alexander Watson, James Miller Speirs, and Thomas Hall James Douglas.

FINAL EXAMINATION (L.R.C.P. & S. EDIN., L.R.F.P. & S. GLASG.).
Jean M'Murray Crawford, George Carter Cossar, Patrick Aloysius O'Brien, William Templeton, Joseph William Morris, John Gray M'Kendrick Macaulay, Joseph Michaelson, Robert Phillips Crawford, Ernest Andrew Hamilton, Cecil Stuart Baxter, Thomas Robert Wilson, and Frederick Charles Joseph Mitchell.

LONDON SCHOOL OF TROPICAL MEDICINE.—The following were the successful candidates at the examination held at the termination of the fifty-fourth session (May-July, 1917):—

M. Erfan (with distinction), P. M. Antia, P. A. Dingle, Miss S. Dolmer, and R. R. Syquia.

CENTRAL MIDWIVES BOARD.—A special meeting of the Central Midwives Board was held at Queen Anne's Gate Buildings, Westminster, on July 26th, with Sir Francis H. Champneys in the chair. Certain midwives were struck off the Roll, the following charges, amongst others, having been brought forward:—

The midwife being convicted on her own confession of feloniously using an instrument with intent to procure abortion, and that she was thereupon sentenced to three years' penal servitude. That being in attendance at a confinement and the patient suffering from illness, and continuing so to suffer, the midwife did not explain that the case was one in which the attendance of a registered medical practitioner was required, as provided by Rule E. 20; medical aid having been sought for the patient the midwife neglected to notify the local supervising authority thereof, as required by Rule E. 22 (1) (a); the patient upon whom she was in attendance suffering from puerperal fever she neglected to notify the local supervising authority of the fact, as required by Rule E. 6; being herself liable to be a source of infection by reason of her attendance upon a patient suffering from puerperal fever as aforesaid, she neglected to undergo the disinfection prescribed by Rule E. 6 to the satisfaction of the local supervising authority.

The following advertisement was considered:—

"Newly opened. The ——— Twilight Sleep Home. Patients may now be received for twilight sleep (the painless method of childbirth). Reasonable terms. Experienced Nurses and Accoucheur in attendance. For terms apply to the Matron, ———, C.M.B., ———."

The Board decided that the use of the letters C.M.B. constituted a distinct breach of Rule E. 28, and the Board would require evidence that it had been altogether abandoned. In response to a request for personal advice as regards the advertisement, the Board considered that advertisements of the nature in question were decidedly objectionable; that they were calculated to excite animosity among medical practitioners in the neighbourhood, thereby prejudicing the efficient working of the Midwives Act; and that they were not consistent with the dignity of a midwife's profession.

MEDICO-LEGAL SOCIETY OF LONDON.—The annual general meeting of this society was held at 11, Chandos-street, W., on July 17th, the Right Hon. Sir Samuel Evans, G.C.B., the president, being in the chair. The treasurer's report, showing the substantial financial position of the society, was, together with the report of the honorary secretaries, received and adopted. Sir Samuel Evans was re-elected president for the ensuing year. The honorary treasurer (Mr. Schröder), the honorary editor of Transactions (Mr. Henslowe Wellington), and other officers were re-elected. Dr. B. H. Spilsbury was elected a vice-president, and Dr. C. O. Hawthorne and Dr. F. J. Smith members of council. A discussion took place on a recommendation of the council that it was desirable that aliens of enemy nationality should cease to be either honorary or ordinary members of the society. The recommendation was unanimously approved. It was announced that it is hoped, in the forthcoming session, to resume the ordinary work of the society, and that at the first meeting in October, after the delivery of the president's address, Dr. F. J. Smith would initiate a discussion on medico-legal points involved in the Criminal Law Amendment Bill. Communications from members desirous of participating in this discussion should be addressed to Dr. F. G. Crookshank (honorary secretary), 15, Harley-street, W. 1.

ROYAL MEDICAL BENEVOLENT FUND.—At the last meeting of the committee held on July 10th, 18 cases were considered, and £144 voted to 16 of the applicants. The following is a summary of some of the cases relieved:—

Widow, aged 44, of M.R.C.S. Eng. who practised at Homerton and died in 1913. Applicant, who has been more or less an invalid since childhood, was left with only the proceeds of the sale of the practice, and she has lived on this until it has become practically exhausted. She is unfit for any laborious work. Her late husband was in the R.A.M.C., but realised his pension to purchase the practice. Voted £12 in 12 instalments.—Daughter, aged 62, of M.R.C.S. Eng. who practised at Blackheath and died in 1880. Applicant has through ill-health never been able to work, and has been dependent on a sister who has had to earn her own living and support her, and this with difficulty. Relieved 12 times, £111. Voted £10 in two instalments.—Daughter, aged 62, of L.F.P.S. Glasg. who practised at Mauchline and died in 1833. Applicant's health does not permit her to earn her own living, and is dependent on charity. Has £12 a year from another charity. Relieved 10 times, £114. Voted £12 in 12 instalments.—M.D. Aberd., aged 64, married, with three children, ages 18, 13, and 6. Practised for many years in the Midlands. Since 1881 has suffered from lateral sclerosis due to a fall from a horse. Has several small pensions, and the eldest child is now earning a little. Relieved nine times, £85. Voted an annuity of £26.—Daughters, ages 46, 44, of M.R.C.S. Eng. who practised at Poplar and died in 1892. Endeavour to make a living by taking in boarders at their home in Cornwall, but not successful of late. They supplement this a little by work on a farm. Relieved four times, £40. Voted £10.—Daughter, aged 61, of L.R.C.P. Edin. who practised at Holloway and died in 1884. Applicant has been a chronic invalid for years, and lives with a widowed sister. Only income a pension of £40 from another charity. Relieved 13 times, £115. Voted £12 in 12 instalments.—Widow, aged 68, of M.D. Glasg. who practised at Dennistoun, Glasgow, and died in 1876. Was left entirely without means, with two young children to educate. For years her health has been precarious. Now lives with a married daughter who cannot afford to keep her. Relieved 10 times, £102. Voted £12 in 12 instalments.—Widow, aged 54, of L.R.C.P. & S. Edin. who practised at New Quay and died in 1893. Was left with two young children, and without any means. Both boys are now in the Navy and able to help a little, but owing to ill-health and the dearness of food the applicant cannot manage. Relieved 14 times, £137. Voted £12.—Widow, aged 61, of L.R.C.P. & S. Edin. who practised at Streatham and died in 1913. Applicant left without means, but her brother-in-law allows her to live rent free in a house where she had an occasional paying guest. She will have to leave this house in September, so has no prospect of any income beyond that allowed by the Fund. Relieved four times, £38. Voted £12 in 12 instalments.—Wife, aged 49, of M.B. Oxon., who practised at Dalston. Applicant had to divorce her husband in 1907. There was one daughter of the marriage, now 17 years old. Applicant being a trained nurse has managed to earn her own living, but her health has broken down and she requires a rest. Also wants a little assistance for preparing her daughter for business, who leaves school this month. Relieved once, in 1913, £10. Voted £5.—Daughter, aged 54, of M.R.C.S. Eng. who practised in East London and died in 1895. Applicant's health is very unsatisfactory, and she is unable to work. She has an annuity of £46, but all this is taken to provide food and lodging. Wants a little help to enable her to get a short holiday. Relieved three times, £15. Voted £5.—Widow, aged 54, of L.S.A. Lond. who practised at Middlewich and died in 1905. Was left without means with a young son to educate. She has acted as matron and housekeeper. At the commencement of the war her son had obtained a good post in America and was able to help his mother substantially. He returned to England to join the army and was wounded twice. He now has light occupation at the War Office, but his pay is insufficient to keep them both. Applicant has recently had a severe illness, and wanted a little temporary help. Voted £6.—Widow, aged 75, of M.B. Edin., who practised at Ladywade and Cockpen and died in 1913. Applicant's husband, before his death, had several long illnesses which took all their savings. For the last four years she has lived on her husband's insurance, which is now practically finished, and relatives who could have helped her have recently died. Her health is now very indifferent. Voted £12 in 12 instalments.

Subscriptions may be sent to the acting honorary treasurer, Dr. Samuel West, at 11, Chandos-street, Cavendish-square, London, W. 1.

COLLEGE OF NURSING, LIMITED.—At a meeting held in the Medical Institute, Belfast, on July 26th, Sir Alexander Dempsey presiding, Miss Matheson (Dublin), in the unavoidable absence of Dr. G. Peacocke, explained the objects and the advantages of the proposed new nursing college to be established in London. After some discussion a resolution was passed approving of the College of Nursing.

Miss Eileen Peel has been appointed head of the National Hospital and University College Hospital School of Massage and Electrical Treatment, Queen-square, W.C. 1. The school is in connexion with University College Hospital and the National Hospital for the Paralysed and Epileptic, and will open in October next.

Surgeon-General Michael Thomas Yarr, C.B., and Lieutenant-Colonel Harry Edwin Bruce Bruce-Porter, C.M.G., R.A.M.C. (T.), have been appointed Knights of Grace of the Order of the Hospital of St. John of Jerusalem in England.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Military Service (Review of Exceptions) Act.

ON Wednesday, July 25th, Judge MELLOR, chairman of the Salford Hundred Appeal Tribunal, gave evidence. He did not regard as satisfactory some of the examinations by medical boards in South East Lancashire. He mentioned in particular those at Hulme Town Hall and at Bury. He wished to impress upon the Committee the desirability of taking away the administration of medical boards from the military altogether, and putting it into civilian hands. The areas should not be too large. He added that the medical boards in Lancashire were very much overworked.

Mr. WILLIS BUND, chairman of the Worcester Appeal Tribunal, stated that that body had been dissatisfied with the medical examinations in a number of cases.

Select Committee on Medical Examinations.

The Select Committee of the House of Commons which is inquiring into the subject of medical examinations and re-examinations, particularly with reference to the Military Service (Review of Exceptions) Act, is for the present pursuing its inquiries in private sitting.

HOUSE OF LORDS.

THURSDAY, JULY 26TH.

Government Flour and Health.

Lord RHONDDA (the Food Controller), in the course of his speech on his food policy, said: It will not, I hope, be thought irrelevant if I interpose here a few words on the relation of war bread to the health of the community, which has been causing some anxiety, if I may judge from the complaints which have been reaching the Ministry of Food. These complaints have been investigated, and I am assured by my expert advisers that with the possible exception of the more serious disturbances of digestion, in which almost any form of bread might be harmful, they fail to afford evidence of medical trouble directly due to war bread. Roughly, one half of the complaints refer to diseases the course of which cannot be possibly influenced by the kind of bread consumed. Inquiries addressed to provincial hospitals and sanatoria and to medical officers of health have, in the great majority of cases, elicited unequivocal testimony to the satisfactory quality of the bread so far as its nutritive properties and its effect upon health are concerned. Where small disturbances of health are mentioned, they are such as might be ascribed to the dearth which has obtained of potatoes, green vegetables, and fruit, and to the hot weather experienced in June, which undoubtedly predisposed workers to disturbances of digestion. The complaints as a whole largely reflect the fact that the nation is now nearing the end of the third year of unprecedented strain. The country must face cheerfully the necessity for using bread of a quality somewhat lower than that to which it has grown accustomed. The food value of the bread supplied now is as high as hitherto. The hot weather of June caused an outbreak of the change in bread known as "rope." The micro-organisms responsible for this change are common everywhere, and are not directly harmful to man. There is not, I may say, the slightest foundation for the absurd impression that "rope" is a disease of man. Both the miller and the baker have had considerable difficulties to contend with. ..... In both cases loyal effort has met the greater part of the difficulties, and those which remain will be overcome as experience grows.

HOUSE OF COMMONS.

WEDNESDAY, JULY 25TH.

Contracts of Medical Men in the Army.

Mr. WATT asked the Financial Secretary to the War Office whether the contracts entered into for one year with medical men whereby they would serve for that length of time would be carried out by his department and the doctors brought home on the completion of the service contracted for.—Mr. FORSTER replied: Every medical officer whose contract is for one year is allowed to return home on expiration, unless he elects to renew in the area of operations where he is serving.

Mr. WATT: Will pressure be brought to bear upon these medical men to renew their contracts? Will they be actually free men to come home?—Mr. FORSTER: Yes, so far as I know.

Medical Students and Military Service.

Answering Mr. SNOWDEN, Mr. MACPHERSON (Under Secretary for War) wrote: Under the arrangements at present in force, medical students not in their fourth and fifth year are not in ordinary circumstances called to the colours if, being under the age of 31, they are classified lower than B1, and if they are 31 or over and classified lower than A.

THURSDAY, JULY 26TH.

Supply of Special Flour.

Mr. FELL asked the Parliamentary Secretary to the Ministry of Food whether the special flour to be supplied for the manufacture of bread on doctors' certificates was to be supplied by chemists or by bakers; if the latter, were all bakers to be supplied with stocks of this special flour; and, having regard to the abuses which would arise under such conditions, would the whole matter be reconsidered.—Mr. CLYNES answered: Special flour, when authorised, is supplied not by chemists or by bakers, but by millers, to whom a licence for a specified supply is forwarded in each case. I am not aware that any abuses have arisen, or are likely to arise, under this system, and I see no reason to vary it.

Mr. FELL: How is this special flour to be obtained from the millers?—Mr. CLYNES: Applicants apply in the usual way, supplying a medical certificate to the Food Controller, and then an authorisation is sent to a particular miller to forward the quantity required.

A Ministry of Health.

Answering Mr. CHARLES ROBERTS, who asked whether it was the intention of the Government to introduce into Parliament the proposed Bill for the Ministry of Health before the House adjourned for the Autumn Recess, Mr. BONAR LAW (Chancellor of the Exchequer) said: It is not intended to introduce a Bill on this subject before the House adjourns.

Medical Arrangements in East Africa.

Sir H. DALZIEL asked the Under Secretary for War whether he could give the House an assurance that the medical arrangements and supplies for our sick and wounded in Central and East Africa were in every way satisfactory; whether there was a shortage not only in personnel but in equipment and in drugs; whether the number of men down with dysentery was out of all proportion to the forces engaged; and whether he would take immediate steps to ensure that nothing was lacking for the care of our sick and wounded.—Mr. MACPHERSON replied: We have had a demand lately for an increase of the monthly reserves of personnel and are meeting it. We know of no shortage of equipment or drugs and can fully meet all demands, but a recent cable asks for expedition in supply.

FRIDAY, JULY 27TH.

Prisoners of War.

In reply to Mr. HUME-WILLIAMS, who asked whether the Convention regarding prisoners of war recently concluded at the Hague had been ratified by the German Government, Mr. J. F. HOPE (representing the War Prisoners Department) said: Yes. The agreement has been ratified both by the British and German Governments. It consists of 22 paragraphs, some of which are highly technical. It will be published as a White Paper, and all that I can now do is to summarise its principal provisions:—

1. All existing agreements for direct repatriation shall be resumed.
2. The qualifications on medical grounds both for repatriation and internment in a neutral country of combatant prisoners shall be made more lenient, and shall be based for the time being on the arrangements already in force between France and Germany.
3. The more severely wounded and seriously ill among the prisoners in Switzerland shall be sent back to their own countries in order to make room for others who may now become qualified.
4. In addition to the last named and such further number as the Swiss Government may be able to accommodate, there shall be selected in all for internment in Holland 7500 sick or wounded combatant prisoners of all ranks. The figure of 7500 is the total number of places available for British and German prisoners. There are not 7500 places available for each.
5. All officers and non-commissioned officers, whether in health or not, who have been in captivity for 18 months or more shall be eligible for internment in a neutral country and shall be so interned so far as accommodation can be provided. Procedure shall be according to length of captivity. The Dutch Government will provide places for 6500 of this class.
6. The Dutch Government will further provide for 2000 civilian prisoners, invalids being given a preference.
7. If the number of combatant prisoners eligible for internment (whether on grounds of health or time) outruns the accommodation, a division shall be made between the British and German prisoners of each class in proportion to the number of eligible men of the two nationalities. In the case of civilian prisoners, however, where a strict proportion might give the Germans seven or eight prisoners to one British, it has been agreed that the internment shall proceed on a basis of four to one.
8. The punishment for attempting to escape in both countries shall be reduced to 14 days' special confinement for a simple offence, or two months' confinement if aggravated by an offence against property. All combatant prisoners now undergoing punishment for such attempt shall be released to ordinary captivity at latest by August 1st.
9. All reprisals against individuals shall be at once cancelled. No further reprisals shall take place except on four weeks' notice, and the execution of all sentences for offences committed by combatants or civilians between the date of capture and August 1st shall stand over till the conclusion of peace.

MONDAY, JULY 30TH.

Temporary Commissions in the R.A.M.C.

Mr. ARTHUR SAMUELS asked the Under Secretary for War whether his attention had been called to the dissatisfaction felt by the temporary commissioned officers of the Royal Army Medical Corps with the new form of contract for an indefinite term of service which they were now being asked to sign; whether, owing to such dissatisfaction, temporary commissioned officers had declined to continue their services under the new form of contract; and whether steps had been or would be taken to remove the grievance.—Mr. MACPHERSON replied: Renewal for the period of the present emergency applies only to those medical men who come under the provisions of the Military Service Act, and the terms of the contract will bring them under the same conditions of service as for civilians who are liable under this Act.

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

LEWTHWAITE, ALFRED, M.B. Lond., M.R.C.S., has been appointed Medical Superintendent of the Pinewood Sanatorium.

ST. THOMAS'S HOSPITAL.—Casualty Officers and Resident Anæsthetists: HILMY, A. H., M.R.C.S., L.R.C.P. Lond.; MCARTHUR, A. G. F., M.B., C.M., L.R.C.P. Lond.; WALKER, J. P. S., M.A., M.B., B.Ch. Oxon.; and WARD, G. H., M.R.C.S., L.R.C.P. Lond. Resident House Physicians: CLARK, W. E. LE GROS, M.R.C.S., L.R.C.P. Lond.; DAVIES, T. ANWYL, M.R.C.S., L.R.C.P. Lond.; ELOFF, J. S.,

M.R.C.S., L.R.C.P. Lond.; and HIGGINS, L. G., M.R.C.S., L.R.C.P. Lond. Resident House Surgeons: DILWORTH, T. F. M., M.B., B.Ch., B.A.O. N.U.I.; EDWARDS, M., M.R.C.S., L.R.C.P. Lond.; RYAN, J. F., M.R.C.S., L.R.C.P. Lond.; and WAINWRIGHT, C. B., M.B., B.C. Cantab. House Surgeon to Block 8: WALKER, R. A. Obstetric House Physician: HALE, J., M.R.C.S., L.R.C.P. Lond. Ophthalmic House Surgeon: JENNINGS, H. C., M.R.C.S., L.R.C.P. Lond.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).
When the application of a Belgian medical man would be considered the advertisers are requested to communicate with the Editor.

BARNSLEY, BECKETT HOSPITAL.—Two Female House Surgeons. Salary as arranged, with board, &c.
BRADFORD CITY.—Temporary Assistant School Medical Officer. Salary 8 guineas per week.
BRISTOL ROYAL INFIRMARY.—House Physician and House Surgeon. Salary at rate of £120 per annum, with board, &c.
BURSLEM, HAYWOOD HOSPITAL.—Female Resident Medical Officer. Salary £300 per annum, with board, &c.
CAMBRIDGE, ADDENBROOKE'S HOSPITAL.—House Physician. Salary £150 per annum, with board, &c.
CHELMSFORD, ADMINISTRATIVE COUNTY OF ESSEX.—Tuberculosis Officer. Salary £500 per annum, &c.
CHELTENHAM EYE, EAR, AND THROAT FREE HOSPITAL.—Honorary Surgeon.
DERBY, DERBYSHIRE ROYAL INFIRMARY.—House Surgeon. Salary £200 per annum, with board, &c.
GENERAL MILITARY HOSPITAL, London, N.—Medical Officers. Salary at rate of £1 per day and keep.
HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL, Haverstock Hill, N.W.—House Physician for six months. Salary at rate of £200 per annum, with usual allowances.
IPSWICH, EAST SUFFOLK AND IPSWICH HOSPITAL.—Female Resident.
IPSWICH MENTAL HOSPITAL.—Locum Tenens Medical Officer.
KENSINGTON BOARD OF GUARDIANS.—Resident Locum Tenens Assistant Medical Officer for Marloes-road. Salary 7 guineas per week, with board, &c.
KENSINGTON DISPENSARY AND CHILDREN'S HOSPITAL, 49, Church-street, Kensington.—Temporary Resident Medical Officer.
LIVERPOOL EYE AND EAR INFIRMARY, Myrtle-street.—Female House Surgeon.
MAIDSTONE, WEST KENT GENERAL HOSPITAL.—House Surgeon, unmarried. Salary £250 per annum, with board, &c. Also Assistant House Surgeon. Salary £125 per annum, with board, &c.
MANCHESTER ROYAL EYE HOSPITAL.—House Surgeon. Salary £120 per annum, with board, &c.
PORTSMOUTH, WORKHOUSE INFIRMARY, WORKHOUSE, AND CHILDREN'S HOME.—First Assistant Medical Officer. Salary £300 per annum, with rations, &c.
QUEEN MARY'S HOSPITAL FOR THE EAST END.—House Surgeon.
READING, BERKSHIRE EDUCATION COMMITTEE.—Assistant Medical Inspector of Schools. Salary £400 per annum.
ST. MARK'S HOSPITAL FOR CANCER, FISTULA, AND OTHER DISEASES OF THE RECTUM, City-road, E.C.—House Surgeon. Salary as arranged, with board, &c.
SALFORD ROYAL HOSPITAL.—Junior House Surgeon. Salary at rate of £150 per annum, with board, &c.
SALISBURY GENERAL INFIRMARY.—House Surgeon. Salary £150 per annum, with board, &c.
SHEFFIELD ROYAL INFIRMARY.—Two House Surgeons. Salary £120 per annum, with board, &c.
SHEFFIELD UNION HOSPITAL, Firvale, Sheffield.—Two Resident Assistant Medical Officers. Salary £300 per annum each, with rations, &c.
STAFFORDSHIRE EDUCATION COMMITTEE.—Female Assistant School Medical Inspectors. Salaries at rate of £400 per annum.
STOKE-ON-TRENT COUNTY BOROUGH.—Female Assistant Medical Officer. Salary £350 per annum.
WEST BROMWICH AND DISTRICT HOSPITAL.—Assistant House Surgeon. Salary £120 per annum, with board, &c.
WOLVERHAMPTON AND MIDLAND COUNTIES EYE INFIRMARY.—House Surgeon. Salary £150 per annum, with board, &c.
WOLVERHAMPTON UNION WORKHOUSE.—Assistant Resident Medical Officer and Medical Officer of Cottage Homes. Salary £300 per annum, with rations, &c.

Births, Marriages, and Deaths.

BIRTHS.

HALLINAN.—On July 29th, at Beaumont-street, W., Irene, the wife of Captain Alfred Ernest Hallinan, M.B., R.A.M.C., of a daughter.
WIGHT.—On July 23rd, at Regency-square, Brighton, the wife of Lieutenant B. Wight, R.A.M.C., of a son.

MARRIAGES.

SHELDON—WATSON.—On July 19th, at St. Mark's Church, Bredbury, Cheshire, Harold Sheldon, M.B., Ch.B., Captain, R.A.M.C., to Helena Beatrice, elder daughter of Mr. and Mrs. Watson, Kilurine, King's County.
SHEPHERD—WARWICK.—On July 25th, at St. Andrew's, Wells-street, Lieutenant Douglas R. C. Shepherd, R.A.M.C., to Beryl Vera, daughter of Mrs. Warwick, of Penzance.

DEATHS.

AITKEN.—On July 29th, at Yorkhill Military Hospital, Glasgow, Major James Aitken, R.A.M.C.T., of Ilford, Essex.
CALTHROP.—On July 30th, at St. George's-square, of toxic neuritis, Edward Spenser Calthrop, M.B., B.S., Temporary Surgeon, R.N.
MACNAUGHTON.—On July 25th, George William Falconer Macnaughton, M.D., F.R.C.S. Edin., M.R.C.P. Lond.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

STUDENTS' NUMBER OF THE LANCET.

INFORMATION intended for the Students' Number of THE LANCET must be sent WITHOUT DELAY, addressed to the Sub-Editor, and marked on the envelope "Students' Number Only."

THE CAUSATION OF SEX.

To the Editor of THE LANCET.

SIR,—I have no experience in the breeding of animals, but I have closely observed a series of 1500 maternity cases with the object of elucidating the determination of sex from a clinical standpoint.

In an article published in the *Medical Times*, July 31st, 1916, I gave the various opinions of observers in relation to the determination of sex, including the vitality theory of Bonhote mentioned by your correspondent, Mr. H. G. Regnart, last week. I quite agree that vitality and vigour are essential in the determination of sex, but these terms must be clearly defined.

Bonhote's theory does not harmonise with my experience, and I do not think there are any statistics to show that the offspring from the poor and devitalised inhabitants of the slums has a higher proportion of males than that of the more fortunate classes of society, and *vice-versa*. It is evident that we have to look for the solution of the problem to the physical condition of both parents, both as regards their constitution and the microscopical character of the spermatozoa and ova respectively before fertilisation has taken place. When once the ovum is fertilised the immediate establishment of sex preponderance takes place, depending entirely on the presence of bio-chemical cells—may I say sexual cells?—at the time of conception. And here vitality and vigour come into play, producing male or female offspring in proportion as male or female bio-chemical cells are the stronger in affinity.

To search for the causation of sex in the impregnated ovum would by this reasoning be futile. I think that the clinical observer and the chemist and bacteriologist will have to work hand in hand for the successful elucidation of the cause of sex.

I am, Sir, yours faithfully,
A. P. MURTZ.

Queen's-road, N., July 30th, 1917.

To the Editor of THE LANCET.

SIR,—Mr. J. E. Burton's letter on the Causation of Sex in your issue of July 14th reminds me of a case of a lady whose left ovary I removed many years ago for cystic disease. The right ovary was healthy. One year later she gave birth to full-time twins—a boy and a girl. Mr. Burton's case proves that ova of both sexes may come from the left ovary; mine that they may likewise come from the right ovary.

I am, Sir, yours faithfully,
GEORGE S. BROCK,
Chief Medical Officer, Villa Trento Hospital, S. Giovanni di Manzano, Udine, Italy.

July 24th, 1917.

THE HYPNOTISM OF PHRASES.

To the Editor of THE LANCET.

SIR,—The note in THE LANCET of July 28th upon "Hypnotism of Phrases" is concerned with the writing upon the wall at Belsahazzar's feast, and the sentence so inscribed Mene, Mene, Tekel, Upharsin (in Theodotion Μάνη Θεκὲλ φάρες). Your correspondent suggests that one translation be "A mina, a mina, a shekel and a half," supposing the duplicate mina not reproduced in the Greek of Theodotion is correct. This being one rendering of the phrase has been much substantiated recently by the discovery of a cuneiform tablet bearing an Aramaic docket, in which a word *paras* is used as the equivalent for a half mina. But supposing the numerical rendering is adopted the first word may have been read Menah, "numbered," or "the numbering," and the free translation be (There has been) "enumerated, a mina, a shekel and a half mina." These plain interpretations of the words are irrespective of their mystical meaning, which Daniel only was competent to furnish. The mental route by which he arrived at the esoteric meaning has produced much literature. By way of the Babylonian, supposing the hand wrote in cuneiform, if we omit the first equivalent of the two Menes, the closest analogy to the words in Daniel would be "(Mani) manû siklu uparsi." This read either "Number, weigh, divide," or "Number, weigh, Persian." For the final word Daniel utilises both its significations. Manu may have borne the sense of completion, of a summing-up, of an enumeration, so Daniel uses that synonym for his version of the warning, and if so the cuneiform did contain two words equivalent to Meni. The word rendered "wall" may have a different signification, as it closely resembles the

Assyrian word Kutallu, meaning a grand hall or palace saloon; and the word rendered plaster, perhaps better stucco, would then indicate the wall. The Kutallu would be an outside Selamlik, leading to the banquet-room. If so, and the king sat at table facing the wall separating the two halls, the rendering would run: "At this moment appeared the fingers of a man's hand, and they wrote in front of the chandelier upon the stucco (wall) of the kutallu of the royal palace." The king would thus see either the mystic hand, or the shadow of it, projected by the illuminated chandelier. The belief in such omens was common in Mesopotamia in ancient times.

I am, Sir, yours faithfully,

South Kensington, S.W., July 28th, 1917 JOSEPH OFFORD.

STARVED MONTENEGRO.

THE little kingdom of Montenegro has suffered from the war in a measure wholly incommensurate with its size. As Gladstone once pointed out, Montenegro has established a right to independent existence both on account of its heroic exploits and its contribution to civilisation; for it had a printing press at a time when neither Oxford, Cambridge, nor Edinburgh had one—that is to say, seven years after the establishment of the first printing press in London in 1470. The people are now in actual danger of starvation, and an appeal has been issued by the Committee of Montenegrin Refugees to all the Allied Governments with the hope that something may be done immediately to save them. Only two foods can be obtained, potatoes and maize, and these with great difficulty, while they are sold at famine prices. In the devastated country districts the peasants are trying to live on the leaves, bark, and roots of trees. In Nikchitch the average deaths from starvation are ten a day. The appeal, which bears the names of many prominent Montenegrins, is issued from 14, Rue Montrosier, Neuilly-sur-Seine, Paris.

A "NEEDLE WING GRIP" FOR INTRAMUSCULAR INJECTIONS.

To the Editor of THE LANCET.

SIR,—May I point out that the need for this clever little invention[1] is obviated by the practice taught at the London Hospital Clinic—to plunge the needle in *first*. Wait a little and watch if any blood wells up, and, if not, affix the barrel of syringe and inject. If blood should rise up then withdraw the needle and insert in another place. I have not seen a single instance of this accident occur.

I am, Sir, yours faithfully,

C. STENNETT REDMOND, M.D. N.U.I.

London, E., July 28th, 1917.

ANATOMICAL MANNIKINS.

IN beginning the teaching of anatomy and physiology, nothing can properly take the place of the actual skeleton and anatomical preparations, but the coloured paper mannikins hitherto mostly made in Germany have served a useful purpose, especially for first-aid and nursing classes, as well as for occasional reference by the student of massage and physical treatment. *Baillière's Popular Atlas of the Anatomy and Physiology of the Female Human Body*, with descriptive text by the late Hubert E. J. Biss, and plates by George M. Dupuy, M.D. (London: Baillière, Tindall and Cox. Price 4*s.* net), is a good example of such a mannikin. It is stated to be entirely a British production, and every endeavour has been made to present with such accuracy of detail as the media of reproduction and drawing on the flat will allow the anatomy and physiology of the female body. The coloured plates, measuring 16½ inches by 8½ inches, show respectively the skeleton, the vascular system, the muscles of the front of the body and viscera, the muscles of the back of the body, and the nerves. One of the plates contains also the internal organs superimposed one on the other, according to their approximate position in the trunk. The letterpress is clear, though necessarily brief.

[1] See THE LANCET, July 28th, 1917, p. 124.

METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, August 1st, 1917.

Date.	Rainfall.	Solar Radio in Vacuo.	Maximum Temp. Shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks.
July 26	...	117	77	62	62	64	Overcast
,, 27	...	125	82	62	62	67	Cloudy
,, 28	...	117	81	60	63	67	Cloudy
,, 29	...	100	75	60	61	65	Cloudy
,, 30	0·15	84	68	59	58	61	Cloudy
,, 31	1·62	73	57	55	55	56	Raining
Au. 1	0·51	61	57	54	55	56	Raining

Other information which we have been accustomed to give in these "Readings" is withheld for the period of the war.

Medical Diary for the ensuing Week.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.

MONDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye. Dr. Simson: Diseases of Women.

TUESDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.

WEDNESDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

THURSDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye.

FRIDAY.—10 A.M., Dr. Simson: Gynæcological Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.

SATURDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. Mr. B. Harman: Eye Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

EDITORIAL NOTICES.

IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITOR," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention should be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this office.

Lectures, original articles, and reports should be written on one side of the paper only, *and when accompanied by blocks it is requested that the name of the author, and if possible of the article, should be written on the blocks to facilitate identification.*

Letters, whether intended for insertion or for private information, must be authenticated by the names and addresses of their writers—not necessarily for publication.

We cannot prescribe or recommend practitioners.

Local papers containing reports or news paragraphs should be marked and addressed "To the Sub-Editor."

Letters relating to the publication, sale, and advertising departments of THE LANCET should be addressed "To the Manager."

We cannot undertake to return MSS. not used.

Offices: 423, STRAND, LONDON W.C. 2.

MANAGER'S NOTICES.

VOLUMES AND CASES.

VOLUMES for the first half of the year 1917 will be ready shortly. Bound in cloth, gilt lettered, price 21*s.*, carriage extra.

Cases for binding the half-year's numbers (inland edition) are now ready. Cloth, gilt lettered, price 2*s.* 6*d.*, by post 2*s.* 10*d.*

To be obtained on application to the Manager, accompanied by remittance.

TO SUBSCRIBERS.

WILL Subscribers please note that only those subscriptions which are sent direct to the Proprietors of THE LANCET at their Offices, 423, Strand, London, W.C. 2, are dealt with by them? Subscriptions paid to London or to local newsagents (with none of whom have the Proprietors any connexion whatever) do not reach THE LANCET Offices, and consequently inquiries concerning missing copies, &c., should be sent to the Agent to whom the subscription is paid, and *not* to THE LANCET Offices.

Subscribers, by sending their subscriptions direct to THE LANCET Offices, will ensure regularity in the despatch of their Journals and an earlier delivery than the majority of Agents are able to effect.

THE COLONIAL AND FOREIGN EDITION is published in time to catch the weekly Friday mails to all parts of the world.

TO COLONIAL AND FOREIGN SUBSCRIBERS.

Subscribers abroad are particularly requested to note the rates of subscriptions given on page 4.

The Manager will be pleased to forward copies direct from the Offices to places abroad at the rates shown, whatever be the weight of any of the copies so supplied.

The following journals, magazines, &c. have been received:—American Journal of Medical Sciences, Cornhill Magazine, Revue d'Hygiène, Brain, British Journal of Surgery, American Journal of Orthopedic Surgery, Bulletin of the Johns Hopkins Hospital, Journal of Mental Science, Archives of Pediatrics, Journal of Nervous and Mental Disease.

Communications, Letters, &c., have been received from—

A.—Aberdeen Medico-Chirurgical Society, Librarian of; Australian Red Cross Society, Lond., Assistant Commissioner of; Messrs. Arnold and Sons, Lond.; Mr. N. Almond, Kingston-on-Thames; Messrs. Allen and Hanburys, Lond.; Addenbrooke's Hospital, Cambridge, Sec.-Supt. of; Sir Clifford Allbutt, Cambridge; Dr. Mohammed Afifi, Abbassia; Mr. E. D. Atwell, Sheffield; Messrs. Claudius Ash, Sons, and Co., Lond.; Anderson College of Medicine, Glasgow, Sec. of.

B.—Messrs. Brown, Boveri and Co., Lond.; Dr. A. E. Brindley, Derby; Birkenhead Borough Hospital, Sec. of; Messrs. Bennett Bros., Salisbury; Bradford Corporation, Medical Officer of; Mr. G. Bethell, Lond.; Dr. N. Bedwani, Tanta; Messrs. Burroughs Wellcome and Co., Lond.; Sir Wm. Bennett, K.C.V.O.; Messrs. G. Bell and Sons, Lond.; Messrs. W. H. Bailey and Son, Lond.; Messrs. A. & C. Black, Lond.; Messrs. Boulton and Paul, Norwich; Mr. F. F. G. Brooke, Lond.; Board of Agriculture and Fisheries, Lond.; Capt. Hugh W. Bayly, R.A.M.C.; Beckett Hospital, Barnsley, Hon. Sec. of; Dr. W. A. Brend, Lond.; Messrs. C. Barker and Sons, Lond.; *British Journal of Ophthalmology*, Lond., Editor of, Col. H. A. Bruce, A.M.S.; Dr. George S. Brock, S. Giovanni di Manzano.

C.—Messrs. A. J. Combridge and Co., Lond.; Messrs. J. and A. Churchill, Lond.; Messrs. E. Cook and Co., Lond.; Dr. H. Lechmere Clift; Dr. J. Cates, St. Helens; Dr. H. G. P. Castellain; Messrs. Cadbury Bros., Bournville; Messrs. Cassell and Co., Lond.; G. H. C.; Cambridge University Union Society, Clerk to the; Capt. J. Campbell, R.A.M.C.; Dr. A. E. Carver, Torquay; Caterham Sanitarium, Medical Supt. of; Dr. B. L. Collis, Lond.; City Hospital for Diseases of the Skin, Dublin, Sec. of; Capt. F. J. Child, R.A.M.C.; Cornell University Library, Ithaca, N.Y.; Mr. J. Cobburn, Lond.; Charing Cross Hospital, Lond., Sec. of; Dr. W. A. Chapple, M.P., Lond.; Surg. Hildred Carlill, R.N.; Dr. F. G. Crookshank, Lond.

D.—Messrs. W. Dawson and Sons, Lond.; Daimler Co., Coventry; Dr. A. F. Dixon, Dublin; Derbyshire Royal Infirmary, Derby, Supt. of; Dr. J. W. Dalgliesh, Sutton; Capt. J. D. Dyson, R.A.M.C.; Deputy-Controller of Auxiliary Shipping, Lond.; Department of Agriculture and Technical Instruction for Ireland, Veterinary Branch, Dublin, Chief Inspector of; Denver Chemical Co., Lond.; Lieut.-Col. J. F. Dobson, R.A.M.C.(T.); Mr. S. Dusselma, Lond.; Dr. H. A. Des Vœux, Lond.; Capt. Lyn Dimond, R.A.M.C.

E.—Messrs. Eason and Son, Dublin; Elkhart-Carnegie Public Library, Elkhart, U.S.A., Librarian of; Dr. H. L. Evans, Goring-on-Thames; Mr. D. L. Eadie, Edinburgh.

F.—Messrs. Fletcher, Fletcher and Co., Lond.; F. B; Food Production Department, Lond.; Dr. R. Fortescue Fox, Lond.; Dr. Collingwood Fenwick, Hazel Grove; Dr. W. M. Fletcher, Lond.

G.—Miss E. J. Geary, Warrington; Dr. M. S. Gutteling, Utrecht; Dr. A. D. Gardner, Bedford; Messrs. Gordon and Gotch, Lond.; Mr. John J. Grace, Lond.; Capt. R. P. Garrow, R.A.M.C.; Great Northern Central Hospital, Lond., Sec. of; Guy's Hospital, Lond., Deputy-Supt. of; Mrs. G. E. Greer, Liverpool; Mr. F. C. Goodall, Lond.

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I.—Ipswich Mental Hospital, Med. Supt. of; International Health Board, New York, Librarian of.

J.—Prof. R. Jardine, Glasgow; *Journal of the Royal Army Medical Corps*, Lond., Editor of, Messrs. Johnson and Phillips, Lond.; Capt. W. H. Johnston, R.A.M.C.

K.—Mr. C. T. Kingzett, Frinton-on-Sea; Miss Kavanagh, Lond.; Messrs. H. S. King and Co., Lond.; Kensington Dispensary and Children's Hospital, Asst. Sec. of; Mr. Otto H. Kahn, New York; Dr. Walter Kidd, Lond.

L.—Dr. T. M. Legge, Lond.; Messrs. H. K. Lewis and Co., Lond.; *Laboratory Journal*, Lond., Editor of; Surg. J. Lambert, R.N.; London County Council, Clerk of; Leicester Mental Hospital, Visiting Committee of; Messrs. Lawson and Co. (Bristol), Bristol; Leeds University, Sec. of; Mr. J. B. Strafford Lewis; London Assn. of Nurses, Supt. of; Dr. Thomas Laird, Heywood; Dr. R. Bruce Low, Lond.; Local Government Board, Lond., Sec. of; Capt. Alex. Lundie, R.A.M.C.; London Lock Hospital and Rescue Home, Sec. of.

M.—Mr. W. Martindale, Lond.; Messrs. C. Mitchell and Co., Lond.; Mr. H. E. Merrell, Linslade; Manchester Royal Eye Hospital, Sec. of; Messrs. Mertens and Co., Lond.; Surg. A. C. McAllister, R.N.; *Midland Counties Herald*, Birmingham; Mr. J. E. R. McDonagh, Lond.; Metropolitan Ear, Nose, and Throat Hospital, Lond., Sec. of; Dr. Dan McKenzie, Lond.; Dr. E. D. Macnamara, Lond.; Lieut.-Col. C. C. McCulloch, jr., U.S. Army; Mr. P. Michelli, Lond.; Miss Ida Meller, Lond.; Major R. McCarrison, I.M.S.; Messieurs A. Maloine et fils, Paris; Mr. M. F. Monier-Williams, Chessington; Mr. A. P. Murtz, Lond.; Dr. R. Morton, Lond.; Miller General Hospital, Lond., Sec. of; Miss Imogen H. Murphy, Sec., New Hospital for Women, Lond.

N.—*Nature*, Lond., Editor of; Capt. J. C. Nicholson, R.A.M.C.; National War Museum, Lond., Curator and Sec. of; *The Newspaper World*, Lond.; National Hospital and University College Hospital School of Massage and Electrical Treatment, Lond., Sec. of.

O.—Oakdale Medical Aid Society, Sec. of; Capt. F. A. Osborn, R.A.M.C.

P.—Sir G. Hare Philipson, M.D., Newcastle-upon-Tyne; Messrs. Partridge and Love, Bristol; Price's Patent Candle Co., Lond.; Pharmaceutical Society of Great Britain, Lond., Librarian of; Mr. F. S. L. Piggott, Teignmouth; Dr. J. A. Pierse, Enniscorthy; Dr. F. J. Poynton, Lond.; Mr. Victor G. Plarr, Lond.; Portsmouth Guardians, Clerk to the; Public Health Central Administration, Cairo; Capt. J. Parkinson, R.A.M.C.; Messrs. G. Pulman and Sons, Lond.; Major James Phillips, R.A.M.C.(T.)

Q.—Queen's Hospital, Lond., Hon. Sec. of; *Queensland Government Gazette*, Brisbane.

R.—Capt. W. Rolland, R.A.M.C.; Dr. R.; Messrs. Robertson and Scott, Edinburgh; Messrs. Reynolds and Branson, Leeds; Dr. R. R. Rentoul, Liverpool; Royal Sanitary Institute, Lond., Sec. of; Royal Eye Hospital, Lond., Sec. of; Dr. J. Rivière, Paris; Dr. C. Stennett Redmond, East Ham; Capt. R. M. Stewart, R.A.M.C.; Royal Free Hospital, Lond., Sec. of.

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T.—Lieut. W. B. Terhune; Dr. W. J. Turrell, Oxford; Dr. John Tatham, Oxted.

U.—University College, Bristol, City Librarian of; University College Hospital Medical School, Lond., Sec. of; University College Hospital, Lond., Sec. of.

V.—Dr. T. A. Venema, Groningen; Mr. E. Vandervelde, Lond.

W.—Dr. Neville Wood, Lond.; West Bromwich and District Hospital, Sec. of; Wolverhampton and Midland Counties Eye Infirmary, Sec. of; Mr. A. Wilson, Lond.; Capt. A. E. Williams, R.A.M.C.; Woolwich, Medical Officer of Health of; Capt. J. Cuthbertson Walker, R.A.M.C.; West London Hospital Post-Graduate College; Major J. Curtis Webb, R.A.M.C.; Dr. S. A. K. Wilson, Lond.

Z.—Dr. S. C. Zavitzianos, Corfu.

Letters, each with enclosure, are also acknowledged from—

A.—Mr. S. F. d'Azevedo, Foz do Douro; Mr. W. L. Alliott, Hoyland; Dr. E. Allen, Harrogate; A. L.; Mr. E. Arnold, Lond.; A. R. M.; Anglo-American Pharmaceutical Co., Croydon.

B.—Dr. B. Board, Pilton; Dr. E. Bouchier-Hayes, Aldershot; Col. H. A. Ballance, A.M.S.; Dr. G. E. Beaumont, Eastbourne; Bristol Royal Infirmary, Sec. of; *Bodmin Guardian and Express*, Manager of; *Birmingham Daily Post*, Manager of; Bristol Royal Hospital for Sick Children, Sec. of; Messrs. Bennett Bros., Salisbury; Birmingham Education Committee, Treas. to the; British Oxygen Co., Lond.; Bromley Education Committee, Acct. to the; Messrs. Beghè and Chiapetta, Milan.

C.—Cumberland Infirmary, Carlisle, Sec. of; Messrs. Corbyn, Stacey and Co., Lond.; Messrs. J. & A. Carter, Lond.; Messrs. Cannrick and Co., Lond.; Messrs. Samson Clark and Co., Lond.; Mrs. Cole, Wishford.

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F.—Prof. Frugoni, Udine; Messrs. Fannin and Co., Dublin; Staff-Surg. R. R. Fasson, R.N.; Messrs. H. Frowde and Hodder and Stoughton, Lond.; Dr. C. E. Finlay, Havana; Dr. Oliver Fickl, Lond.

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H.—Messrs Howards & Sons, Lond.; Messrs. J. Haddon and Co., Lond.; Capt. J. A. Hartley, R.A.M.C.; Hoffmann-La Roche Chemical Works, Lond.; Capt. E. W. N. Hobhouse, R.A.M.C.; Mr. D. Hogg, Liverpool; Messrs. T. Hollard and Son, Lond.; Dr. H. E. Haynes, Hove; Messrs. Hogg and Son, Lond.; Capt. J. F. Hill, R.A.M.C.

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S.—Synthetic Drug Co., Toronto; St. Audry's Hospital, Milton, Clerk to the; Capt. A. F. S. Sladden, R.A.M.C.; South Devon and East Cornwall Hospital, Plymouth, Sec. of; Messrs. W. H. Smith and Son, Lond.; Sheffield Royal Hospital, Sec. of; St. Bartholomew's Hospital, Rochester, Sec. of; Dr. F. Stoker, Lond.; St. Andrew's Hospital, Northampton, Acct. to the; St. John Ambulance Association, Lond., Acct. to; St. Mary's Hospitals, Manchester, Sec. of; Swiss Bank Corporation, Lond.

T.—Mr. J. Thin, Edinburgh.

V.—Capt. K. B. Vickers, R.A.M.C.; Messrs. Van Houten, Lond.

W.—West Kent General Hospital, Maidstone, Sec. of; Capt. E. C. Wilford, C.A.M.C.; Mr. A. Wilson, Lond.; Messrs. Willows, Francis, Butler and Thompson, Lond.